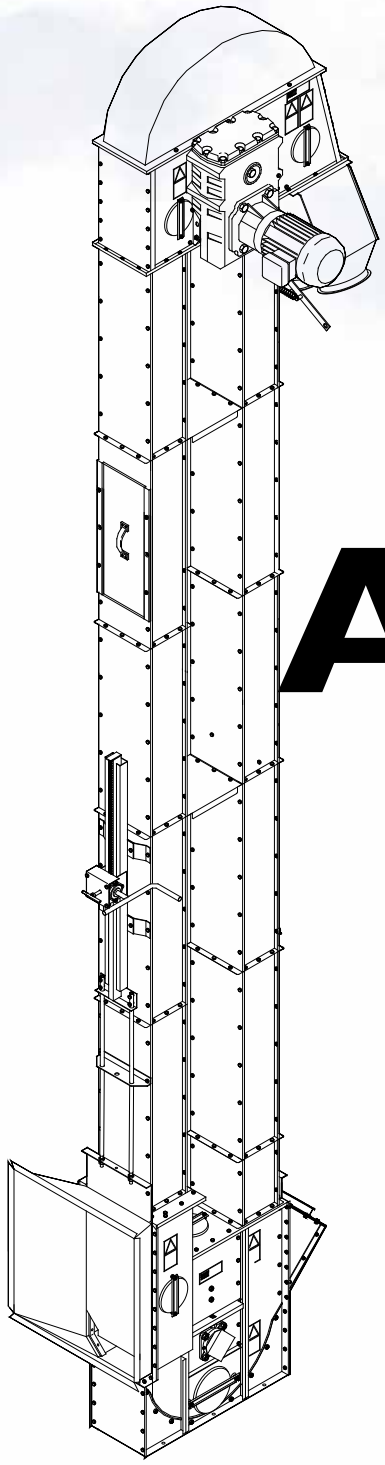
Installation and Operating Instructions

ANTTI E-SERIES ELEVATORS

408010 (en)



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11-2013

Read the Installation and Instruction Manual carefully before installing the machine and putting it into operation.

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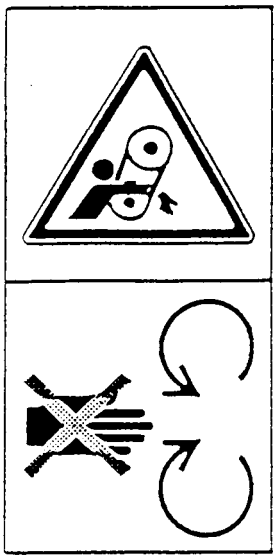
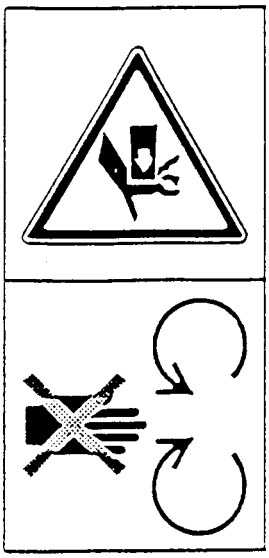
SAFETY

- **The elevator has moving parts which cause serious injuries if touched while the machine is in operation! Never open the hatches or covers of the machine unless you have first ensured that the power supply circuit is disconnected, e.g., by removing the fuse!**
- The following warning signs are affixed to the elevator:



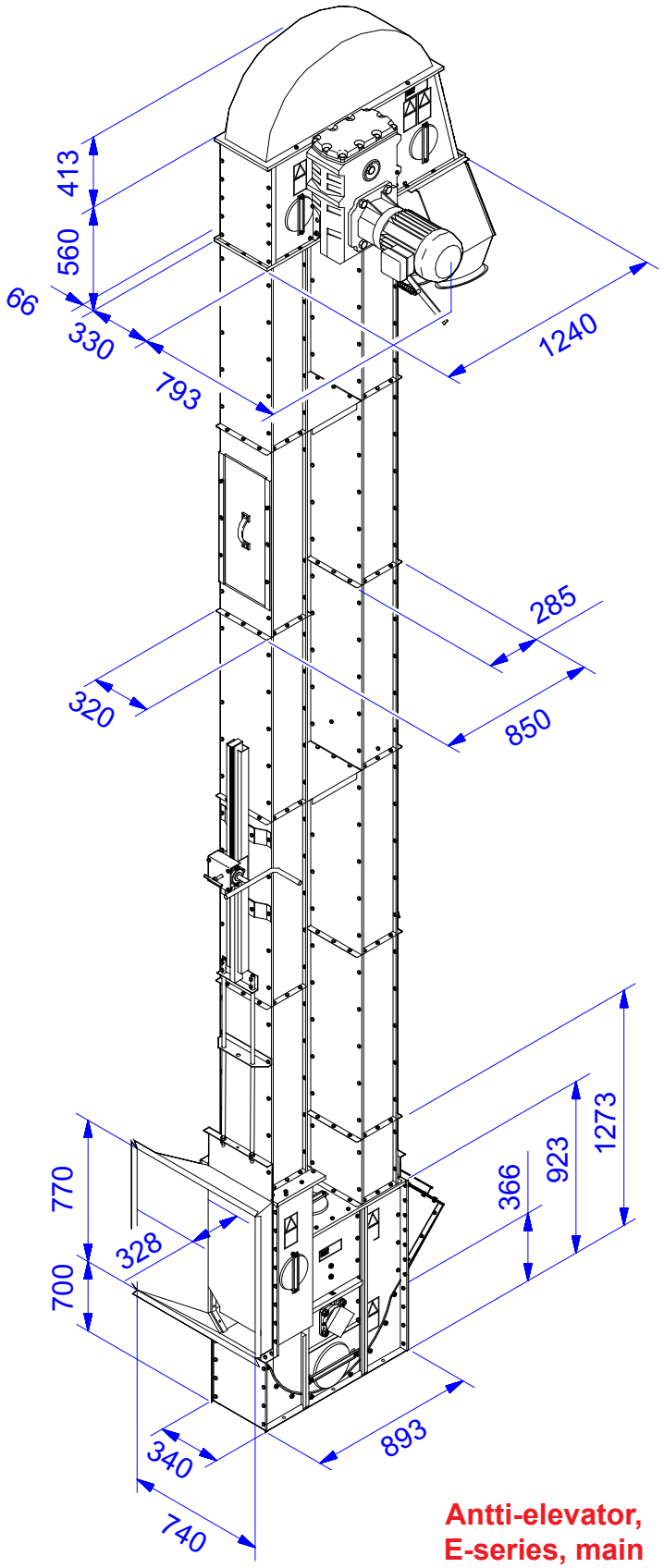
Never open the belt cover while the machine is in operation - risk of injury to hand and arm!



Never open the hatch while the machine is in operation - risk of injury to hands and fingers!

**Special care needs to be taken when making the initial settings, as the elevator will be operated with part of the control and service hatches open at various times.
Risk of injury!**

Elevator, E-series



Antti-elevator, E-series, main dimensions

INTRODUCTION AND INTENDED USE OF THE MACHINE

* The Antti E-series farm elevator is designed for vertical transfer of grain and granular materials.

* Note! Farm elevators equipped with standard parts are not suitable for conveying sand or other materials that cause excessive wear. Nor are they recommended for transfer of substances exceeding 20 mm in particle size.

* The elevator is of bucket belt type. The buckets are installed so that they form groups. Seen from above, each group consists of 2 - 6 bottomless buckets and one bucket (the lowest) with bottom. The bucket belt is of rubber. The belt has three reinforcement plies.

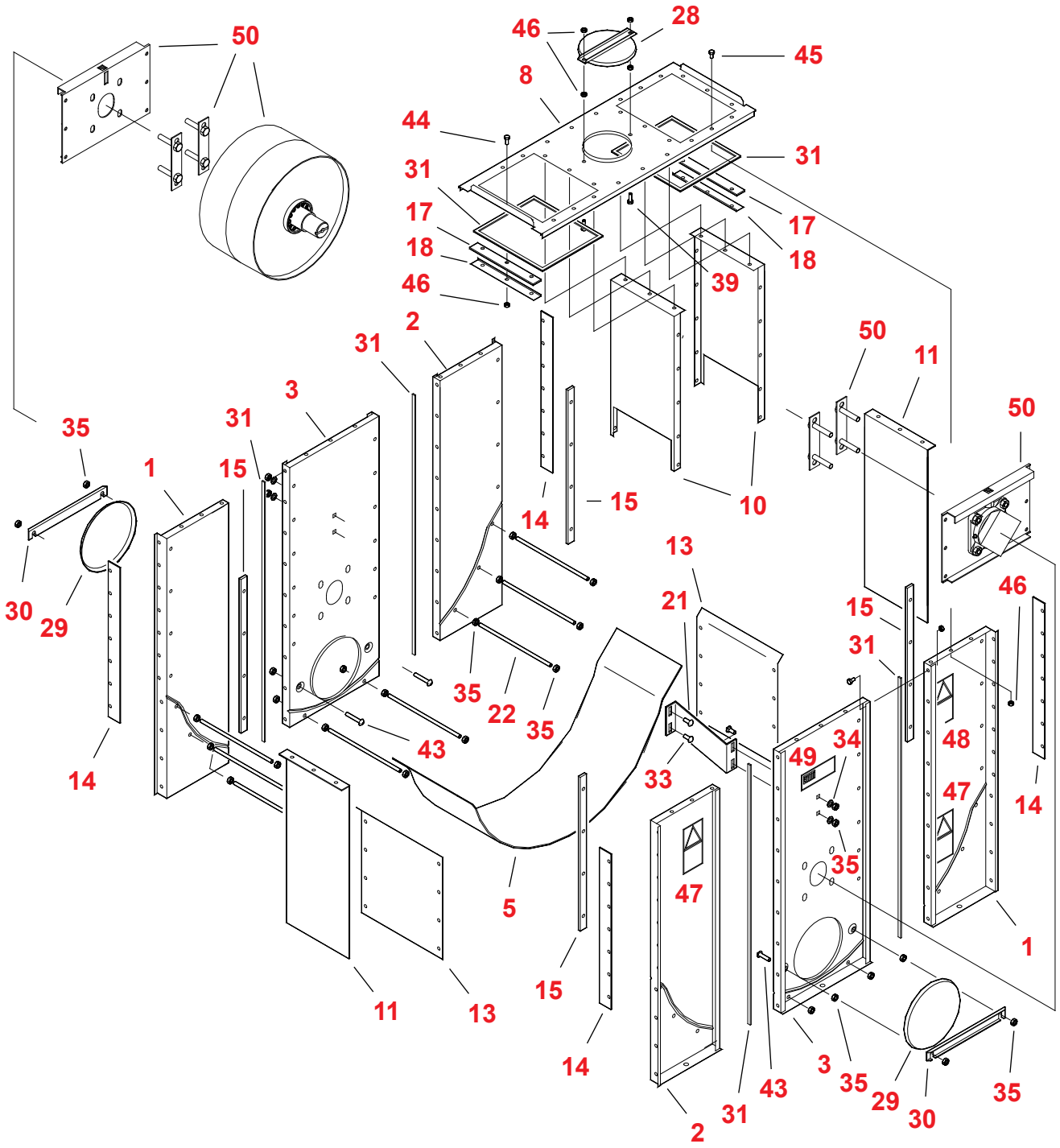
* The frame pipes of the elevator are made of hot-galvanized steel plate with rectangular profile. The top part and the boot are the other parts of the elevator's frame structure. They are also mostly made of hot-galvanized raw material.

* In addition to the above components, the elevator delivery includes many other items, which are delivered separately. The installation locations for these items are described later in these Assembly Instructions. The components of any optional equipment are also delivered separately.

* The noise emission of a loaded elevator is 73 dB.

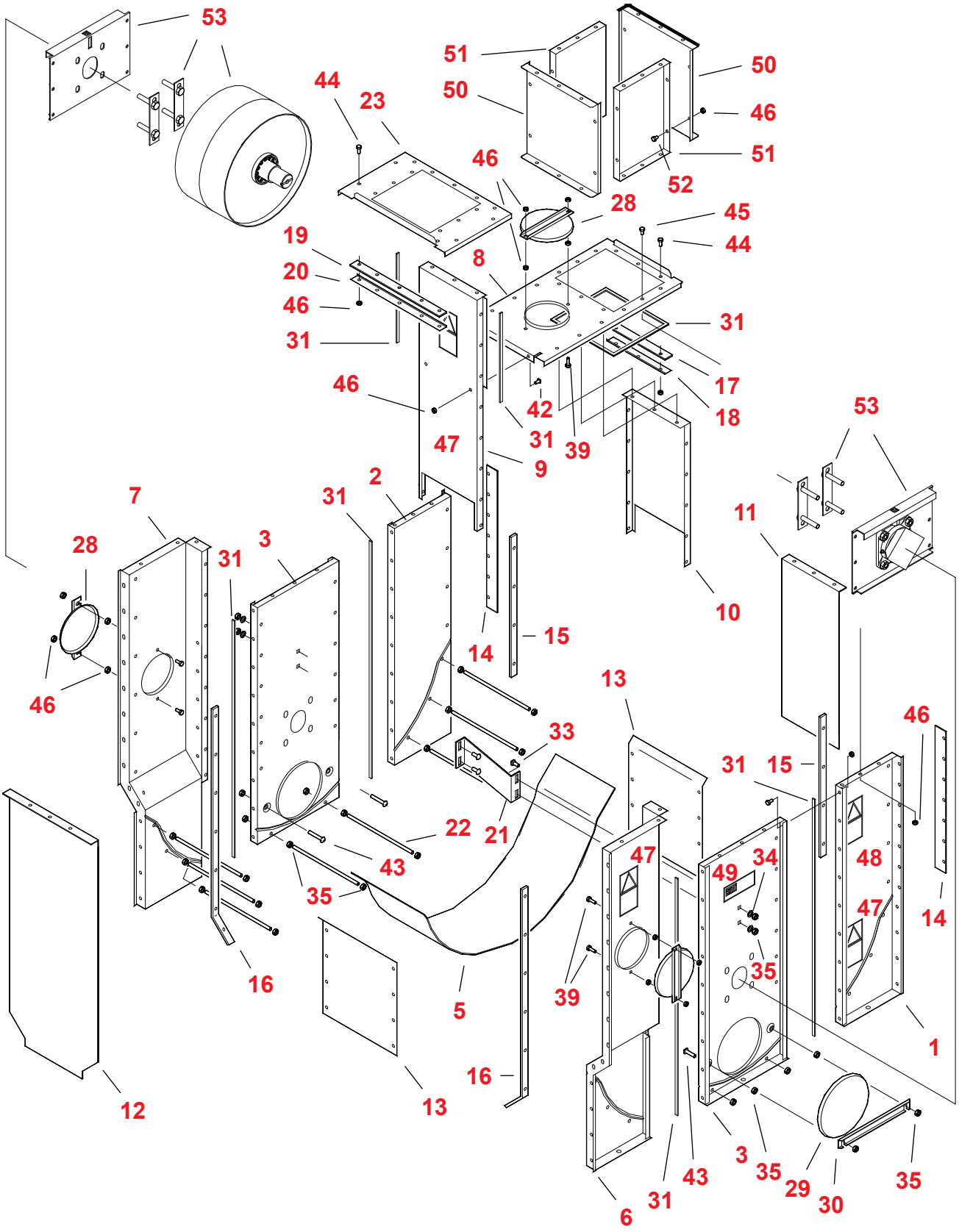
ANTTI-ELEVATOR, E-SERIES, PARTS DRAWINGS

Elevator boot - housing parts for the boot, symmetric model



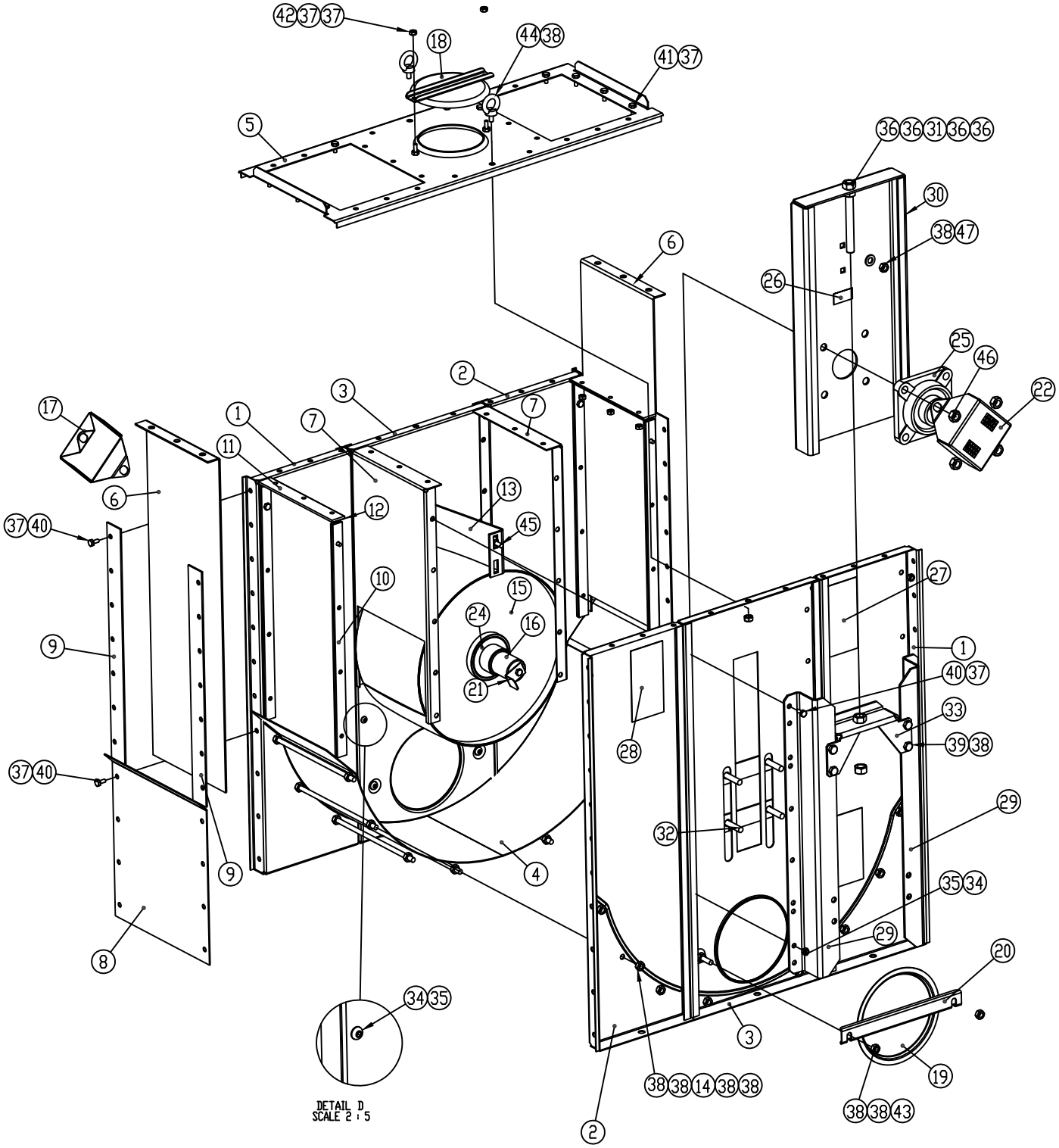
Ref.	Part	Pcs	Item	Note!
1	32477	2	Side-plate - low, right	
2	32478	2	Side-plate - low, left	
3	32479	2	Side-plate - centre part	
5	32480	1	Bottom arc	
8	32474	1	Top plate - symmetric	
10	32475	2	Intermediate plate - return side	
11	32481	2	Shutter plate - return side	
13	41884	2	End-plate	
14	41885	4	Guide strip - return side	
15	41889	4	Support strip - return side	
17	41887	2	Sealing felt - return side	
18	41886	2	Attachment strip for felt - return side	
21	41888	1	Scraper	
22	41898	8	Joining screw	M10
28		1	Control hatch with retainer D170	41560
29	400141	2	Hatch D225	
30		2	Hatch retainer	41552
31	115570	10 m	Cell rubber sealing	4x10
33	107907	4	Lock screw	M10x25
34	111560	4	Washer	M12
35	110560	44	Hexagon nut	M10
39	101830	2	Hexagon bolt	M8x25
43	104260	4	Hexagon socket bolt, ball-headed	M10x40
44	101820	6	Hexagon bolt	M8x20
45	101810	103	Hexagon screw	M8x16
46	110540	111	Hexagon nut	M8
47	117774	5	Sticker - Never open the covers while the machine is in operation	
48	117770	2	Sticker - Read the Instruction Manual	
49	117911	1	Sticker - Nameplate	
50		-	Bucket belt pulley with bearings	Incl. Parts 1-11 from page "Bucket belt, pulleys, bearings and drive"
			ELEVATOR BOOT	Incl. Parts 1-50
-	**503487**	1	Symmetric model, assembly	

Elevator boot - housing parts for the boot, elevated model



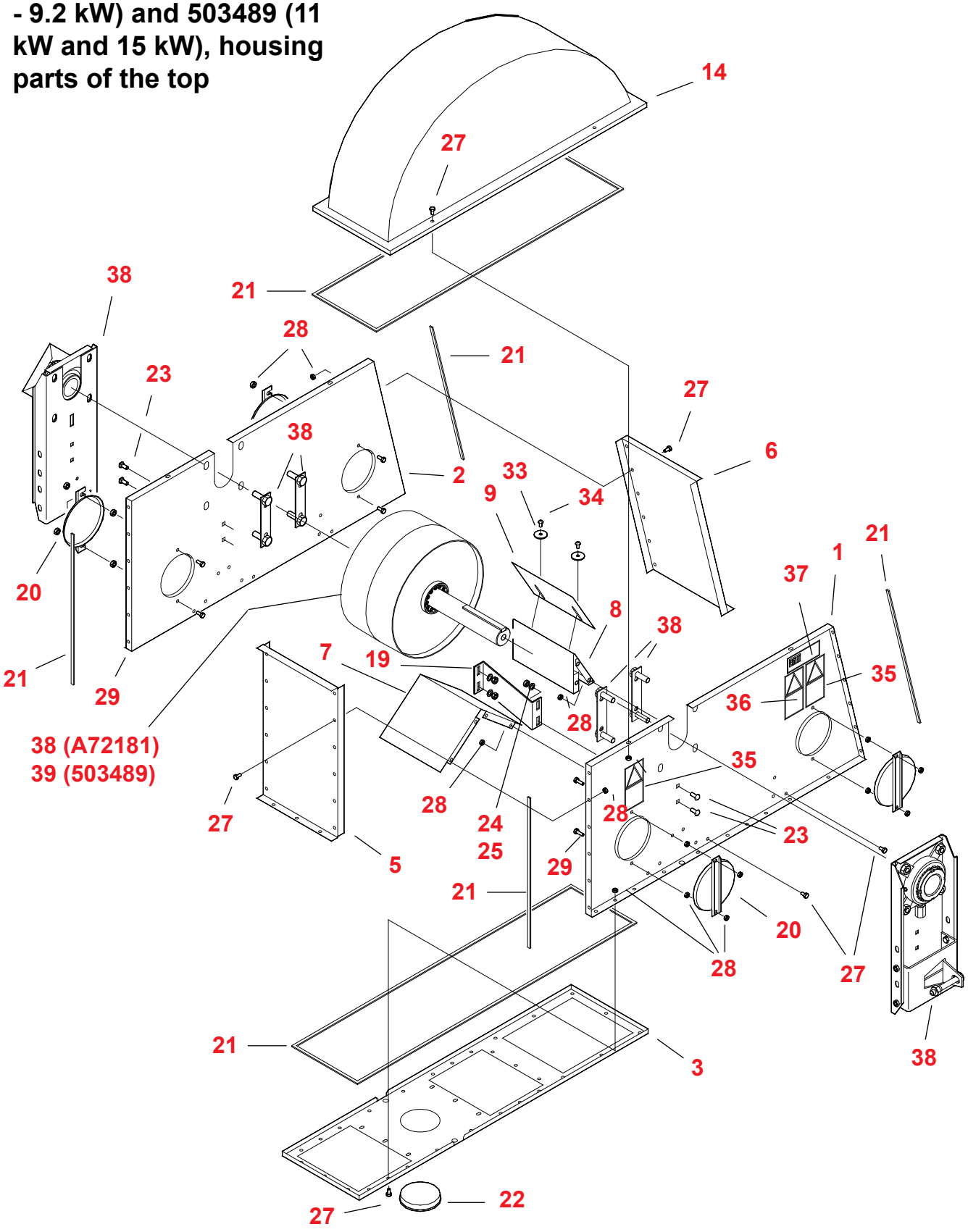
Ref.	Part	Pcs	Item	Note!
1	32477	1	Side-plate - low, right	
2	32478	1	Side-plate - low, left	
3	32479	2	Side-plate - centre part	
5	32480	1	Bottom arc	
6	22387	1	Side-plate - elevated, right	
7	22388	1	Side-plate - elevated, left	
8	32489	1	Top plate - return side	
9	32496	1	Intermediate plate - ascending side	
10	32475	1	Intermediate plate - return side	
11	32481	1	Shutter plate - return side	
12	32495	1	Shutter plate - ascending side	
13	41884	2	End-plate	
14	41885	2	Guide strip - return side	
15	41889	2	Support strip - return side	
16	41899	2	Supports strip - ascending side	
17	41887	1	Sealing felt - return side	
18	41886	1	Attachment strip for felt - return side	
19	41901	1	Sealing felt - ascending side	
20	41900	1	Attachment strip for felt - ascending side	
21	41888	1	Scraper	
22	41898	8	Joining screw	M10
23	32494	1	Top plate - ascending side	
28		3	Control hatch with retainer D170	41560
29	400141	2	Hatch D225	
30		2	Hatch retainer	41552
31	115570	10 m	Cell rubber sealing	4x10
33	107907	4	Lock screw	M10x25
34	111560	4	Washer	M12
35	110560	44	Hexagon nut	M10
39	101830	6	Hexagon bolt	M8x25
42	104261	2	Hexagon socket bolt, ball-headed	M8x16
43	104260	4	Hexagon socket bolt, ball-headed	M10x40
44	101820	8	Hexagon bolt	M8x20
45	101810	139	Hexagon bolt	M8x16
46	110540	163	Hexagon nut	M8
47	117774	5	Sticker - Never open the covers while the machine is in operation	
48	117770	2	Sticker - Read the Instruction Manual	
49	117911	1	Sticker - Nameplate	
50	32529	2	Top plate L = 0,35 m	
51	32532	2	Side-plate L = 0,35 m	
52	101800	8	Hexagon bolt	M8x12
53		-	Bucket belt pulley with bearings	Incl. Parts 1-11 from page "Bucket belt of the elevator, pulleys, bearings and drive"
-	**503485**	1	ELEVATOR BOOT Elevated model, assembly	Incl. Parts 1-53

Elevator boot - adjustable boot



Ref	Item ID	Name	Pcs
1	32477		2
2	32478		2
3	A72209		2
4	32480		1
5	32474		1
6	32481		2
7	A72241		2
8	41884		2
9	41885		4
10	41889		8
11	41887		2
12	41886		2
13	41888		1
14	41898		8
15	32487		1
16	32483		1
17	31907		1
18	41560		1
19	41551		2
20	41552		2
21	42376		1
22	33179		1
23	115570		10
24	314016	TENSION SLEEVE 60X 90 BONFIX 2000	2
25	116521	FLANGE MOUNTED BEARING UCF 210 (FY50TF)	2
26	117911		1
27	117770		2
28	117774		4
29	A72219		4
30	A72220		2
31	A72222		2
32	41917		4
33	A72264		2
34	104266	HEXAGON SOCKET BOLT, BALL-HEADED 8X20AM ISO 7380	4
35	110790	NYLOC NUT ZN M8 DIN 985	4
36	110585	NUT M16 DIN934	8
37	110540	NUT M8 DIN 934	148
38	110560	NUT M10 DIN 934	54
39	102200	HEXAGON BOLT ZN 10X20 DIN933	8
40	101810	HEXAGON BOLT ZN 8X16 DIN933	139
41	101820	HEXAGON BOLT ZN 8X20 DIN933	6
42	101830	HEXAGON BOLT ZN 8X25 DIN933	2
43	104260	HEXAGON SOCKET BOLT, BALL-HEADED 10X40 AM ISO 7380	4
44	107807	EYE BOLT M10X18 DIN580	2
45	107907	LOCK SCREW ZN M10X25 DIN603 8.8	4
46	110580	NUT M14 DIN934	8
47	111560	WASHER ZN M12 ZN DIN 125	4

Elevator top A72181 (3 kW - 9.2 kW) and 503489 (11 kW and 15 kW), housing parts of the top

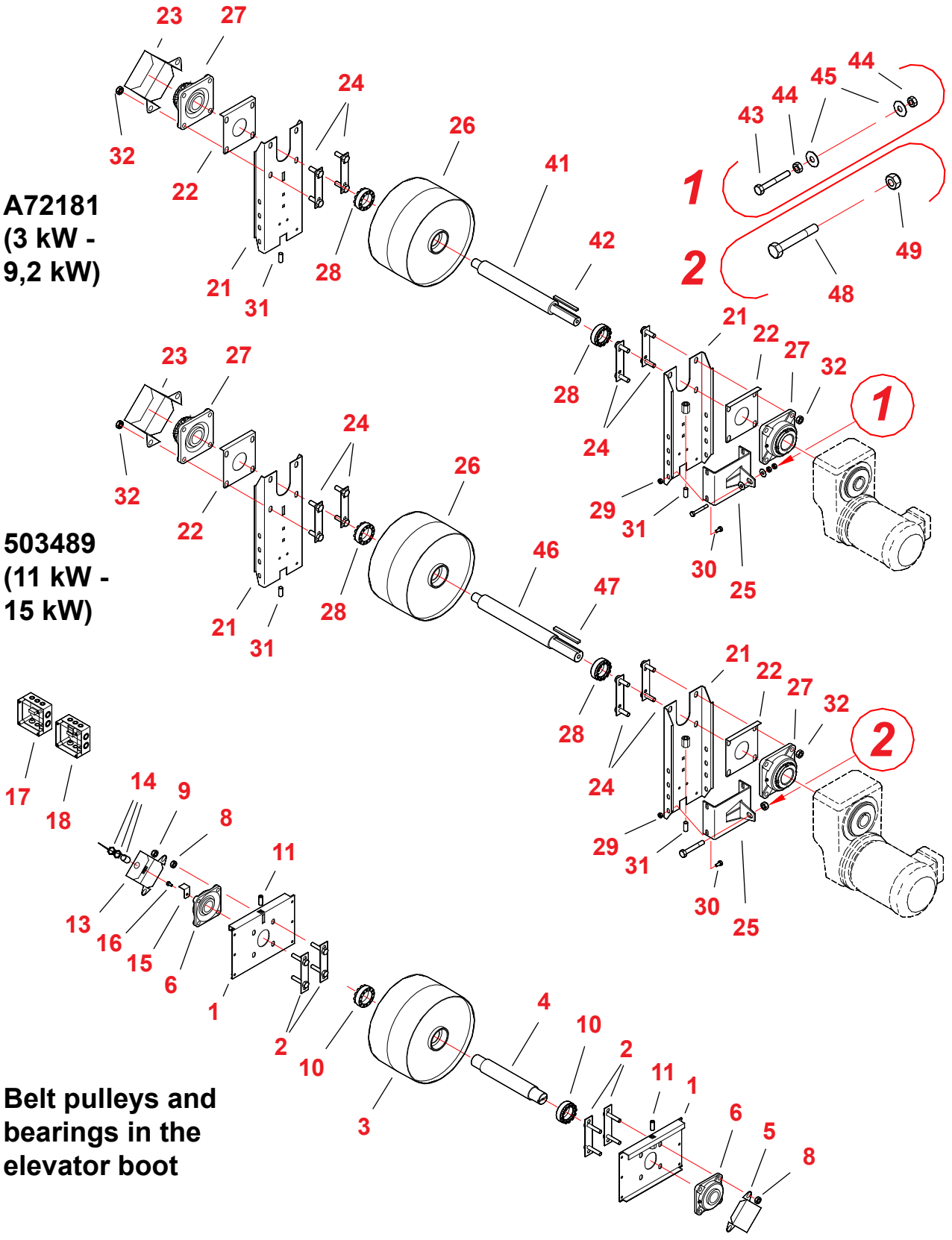


Ref.	Part	Pcs	Item	Note!
1	32497	1	Side-plate - right	
2	32498	1	Side-plate - left	
3	32502	1	Bottom plate	
5	32499	1	End-plate - ascending side	
6	32500	1	End-plate - return side	
7	32503	1	Intermediate plate	
8	32504	1	Intermediate plate - adjustable	
9	41913	1	Adjustment part of the intermediate plate	
14	32525	1	Cover	
19	41888	1	Scraper	
20		4	Control hatch with retainer D170	41560
21	115570	10 m	Cell rubber sealing	4x10
22	116092	1	Plastic plug	
23	107907	4	Lock screw	M10x25
24	111560	4	Washer	M12
25	110560	4	Hexagon nut	M10
27	101810	72	Hexagon bolt	M8x16
28	110540	88	Hexagon nut	M8
29	101830	8	Hexagon bolt	M8x25
33	400122	2	Washer	D40/9
34	104261	2	Hexagon socket bolt, ball-headed	M8x16
35	117774	4	Sticker - Never open the covers while the machine is in operation	
36	117770	2	Sticker - Read the Instruction Manual	
37	117911	1	Sticker - Nameplate	
38		-	**Bucket belt pulley with bearings Nord 3282**	**Incl. parts 21-32, 41-45 "Bucket belt of the elevator, pulleys, bearings and drive" from next page**
39		-	***Bucket belt pulley with bearings Nord 4282***	***Incl. parts 21-32, 46-49 "Bucket belt of the elevator, pulleys, bearings and drive" from next page***
-	**A72181**	**1**	**ELEVATOR TOP For Nord 3282 gear motor, (Nord 3282) assembly**	**Incl. Parts 1-38**
-	***503489***	***1***	***ELEVATOR TOP For Nord 4282 gear motor, (Nord 4282) assembly***	***Incl. Parts 1-37, 39***

Belt pulleys and bearings in the elevator top A72181 (3 kW - 9,2 kW) and 503489 (11 kW and 15 kW)

A72181 (3 kW - 9,2 kW)

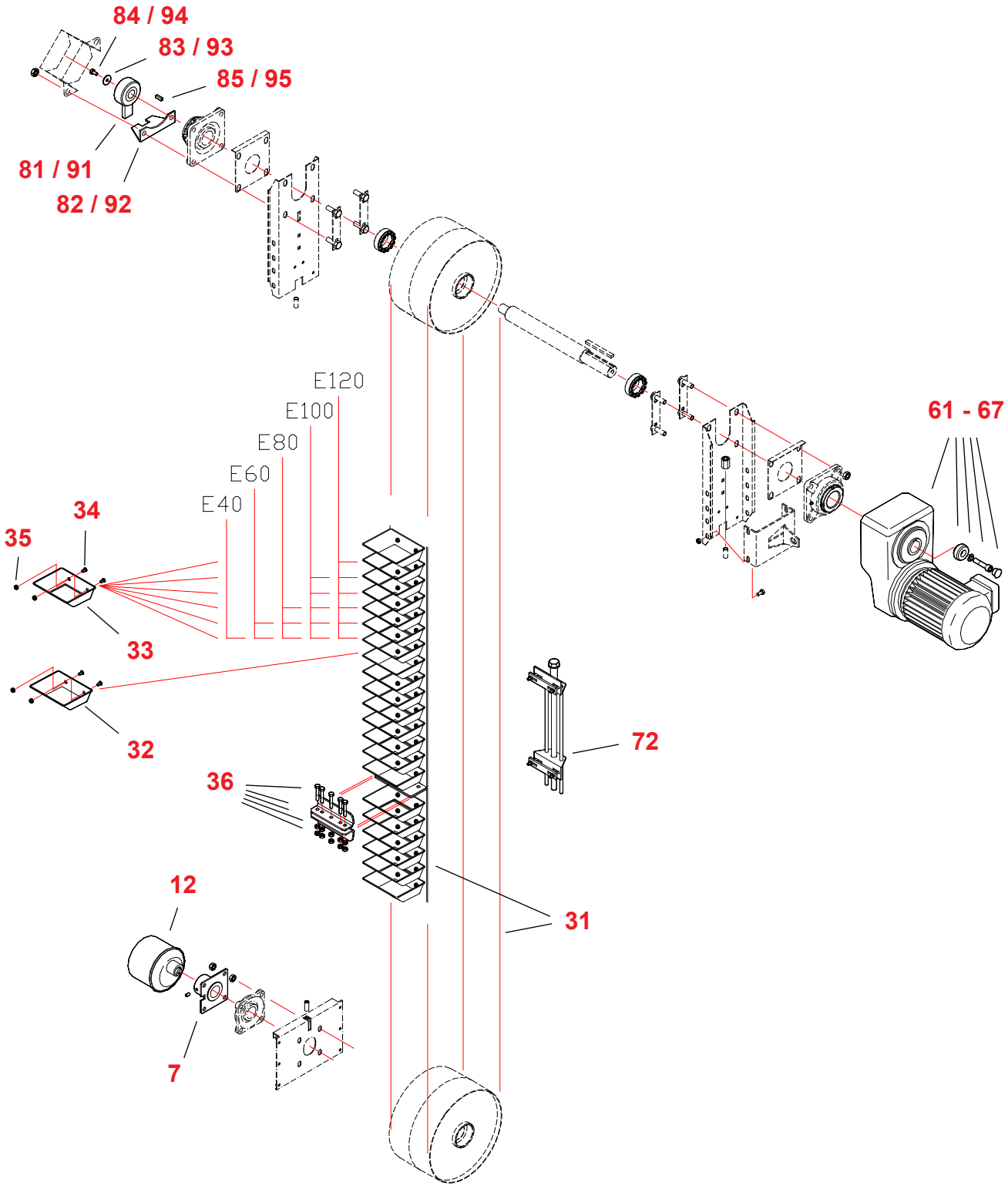
503489 (11 kW - 15 kW)



Belt pulleys and bearings in the elevator boot

Ref.	Part	Pcs	Item	Note!
1	32476	2	Stiffening plate, elevator boot	
2	41917	4	Counter-part for bearing UFC210	
3	32487	1	Bucket belt pulley D400	
4	32483	1	Shaft in the boot D60/50	
5	400920	1	Shaft end cover, elevator boot	
6	116521	2	Flange-mounted bearing UFC210 D50	
8	110580	8	Hexagon nut	M14
9	110814	4	Nyloc nut	M14
10	314016	2	Tension sleeve	60x90
11	105560	2	Stop screw	M16x40
13	33179	1	Casing, for inductive underspeed guard	
14	511512	1	Inductive sensor	80 r.p.m.
15	42376	1	Claw-plate	
16	101810	1	Hexagon bolt	M8x16
17	511511	1	Relay box	230V
18	511513	1	Relay box	24VDC
21	32501	2	Stiffening plate, elevator top	
22	41914	2	Cover plate for the hole	
23	400900	1	Shaft end cover, elevator top	
24	41916	4	Counter-part for bearing UKF 213	
25	32505	1	Torque arm	
26	32487	1	Bucket belt pulley D400	
27	116530	2	Flange-mounted bearing UKF213 + H213 D60	
28	314016	2	Tension sleeve	60x90
29	110560	4	Hexagon nut	M10
30	102200	4	Hexagon bolt	M10x20
31	105560	2	Stop screw	M16x40
32	110585	8	Hexagon nut	M16
41A72182		**1**	**Shaft in the top Ø 40 mm**	**For Nord SK3282 gear**
42	**A70771**	**1**	**Rectangular key**	**8x12, Nord SK3282**
43	**102630**	**1**	**Hexagon bolt**	**M12x80, Nord SK3282**
44	**110570**	**2**	**Hexagon nut**	**M12, Nord SK3282**
45	**111566**	**2**	**Fender washer**	**M12, Nord SK3282**
46	***32488***	***1***	***Shaft in the top Ø 50 mm***	***For Nord SK4282 gear***
47	***41959***	***1***	***Rectangular key***	***9x14, Nord SK4282***
48	***103045***	***1***	***Hexagon bolt***	***M16x110, Nord SK4282***
49	***110812***	***1***	***Nyloc nut***	***M16, Nord SK4282***

Gear motor and belt for the belt drive of the elevator and the optional and additional equipment



Ref.	Part	Pcs	Item	Note!
			Optional components:	
7	32482	1	Socket UFC210, underspeed guard 110 r.p.m.	Applies to earlier production only
12	511520	1	Underspeed guard 110 r.p.m.	Applies to earlier production only
			Bucket belt:	
31	510575	/m	Bucket belt, perforated	B 200 100/75
32	300695	*)	Elevator bucket, with bottom	GB 180x140
33	300696	**)	Elevator bucket, bottomless	GB 180x140
34	110040	2	Belt screw (pcs. / part 67 and 68)	M8x22
35	110790	2	Nyloc nut (pcs / part 67 and 68)	M8
36	A70217	1 (2)	Joining kit for belt, incl. nuts and bolts	
37	503630	1	Joining tool	

)** ***E120 ... E100 1,9 pcs./metre of belt, E80 ... E40 2,22 pcs./metre of belt

****)** ***E120 11,43 pcs./metre of belt, E100 9,52 pcs./metre of belt, E80 6,67 pcs./metre of belt, E60 4,44 pcs./metre of belt, E40 2,22 pcs./metre of belt***

			Gear motor:	
61	304305	1	Gear motor Nord SK 3282AGB-100L/40	3,0 kW-144 r.p.m.
	E40: -> 15,7 m			
62	304306	1	Gear motor Nord SK 3282AGB-112M/4	4.0 kW-147 r.p.m.
	E40: 16,2-20,7 m, E60: -> 14.7 m			
63	304307	1	Gear motor Nord SK 3282AGB-132SM/4	5,5 kW-148 r.p.m.
	E40: 21,2-20,7 m, E60: -> 19,7 m, E80: -> 14,7 m, E100: -> 11.7 m			
64	304308	1	Gear motor Nord SK 3282AGB-132M/4	7,5 kW-147 r.p.m.
	E40: 27,2-35,2 m, E60: 20,2-26,7 m, E80: 15,2-19,7 m, E100: 12.2-16,7 m, E120: -> 13.7 m			
65	304309	1	Gear motor Nord SK 3282AGB-132M/40	9.2 kW-148 r.p.m.
	E60: 27.7-32,7 m, E80: 20.2-24,7 m, E100: 17.2-19,7 m, E120: 14.2 - 16.7 m			
66	304302	1	Gear motor Nord SK 4282AGB-160M/4	11 kW-135 r.p.m.
	E60: 33.2-35,2 m, E80: 25.2-29,7 m, E100: 20.2-23,7 m, E120: 17.2 - 19.7 m			
67	304303	1	Gear motor Nord SK 4282AGB-160L/4	15 kW-135 r.p.m.
	E80: 30,2-35,2 m, E100: 24.2-35,2 m, E120: 20.2 - 26.7 m			

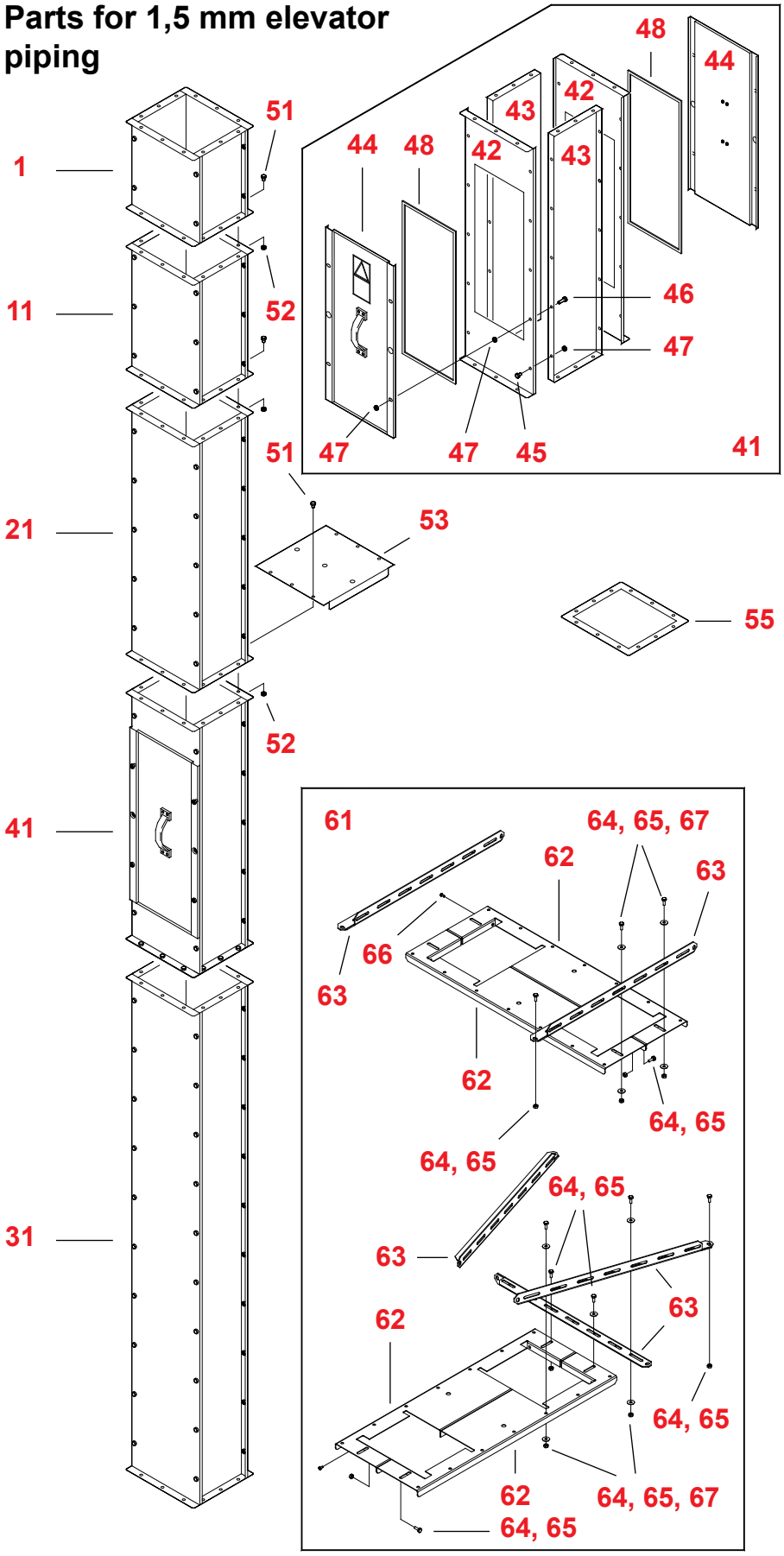
Additional equipment: Nord 3282 3.0 ... 9.2 kW

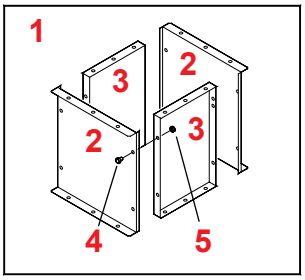
-	**505910**	1	Back rotation stop ($ 81 - 85)
81	316001	1	Back rotation stop
82	33180	1	Torque arm
83	400120	1	Washer, D40/11
84	102200	1	Hexagon bolt M10x20
85	42398	1	Rectangular key, 10,8

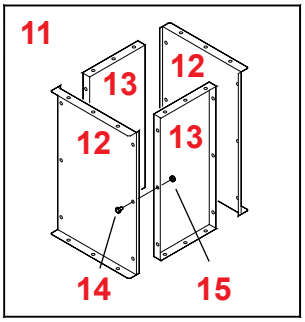
Nord 4282 11 ... 15 kW

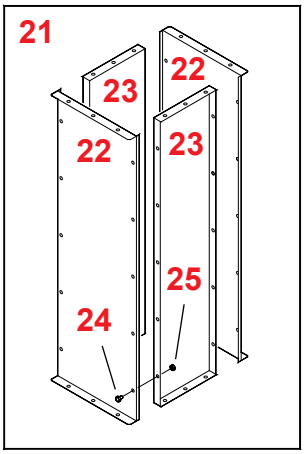
-	**505920**	1	Back rotation stop ($ 91 - 95)
91	316005	1	Back rotation stop
92	A72247	1	Torque arm
93	400340	1	Washer, D52/17
94	102900	1	Hexagon bolt M16x30
95	A72246	1	Rectangular key, 14x9

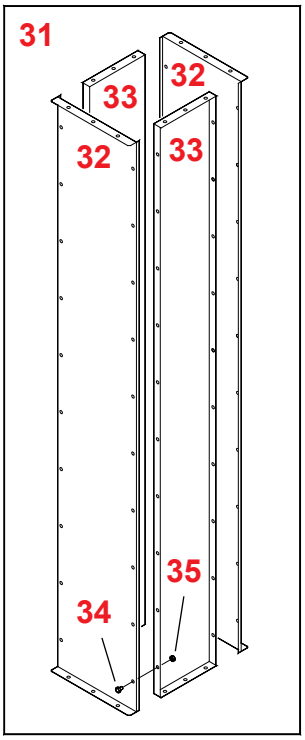
Parts for 1,5 mm elevator piping









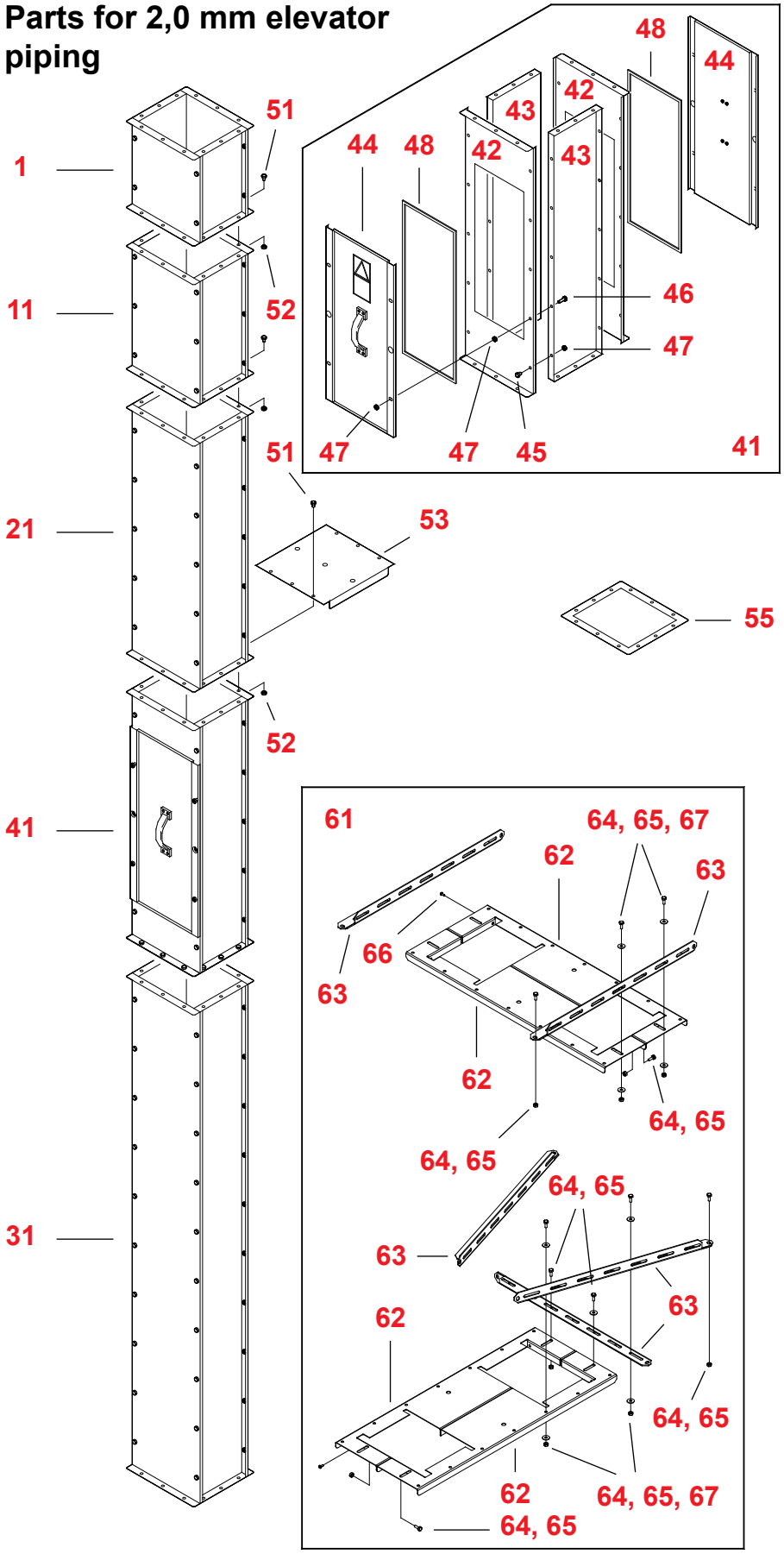


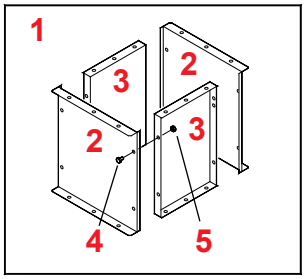
Max. height of the piping 25 m

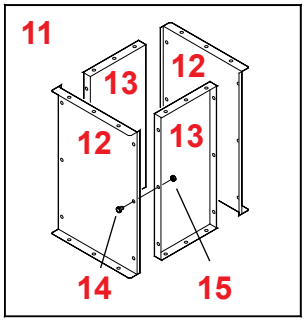
Ref.	Part	Pcs	Item	Note!
1	**32657**	*)	ELEV. PIPE E L 350 MM, S 1.5 MM	Incl. Parts 2-5
2	32529	2	TOP PLATE E L 350 MM, S 1,5 MM	
3	32532	2	SIDE-PLATE E L 350 MM, S 1,5 MM	
4	101800	8	BOLT 6K ZN 8.8 AM DIN933	M8X12
5	110540	8	NUT ZN 8 DIN934	M8
11	**32651**	*)	ELEV. PIPE E L 500 MM, S 1,5 MM	Incl. Parts 12-15
12	32527	2	TOP PLATE E L 500 MM, S 1,5 MM	
13	32531	2	SIDE-PLATE E L 500 MM, S 1,5 MM	
14	101800	12	BOLT 6K ZN 8.8 AM DIN933	M8X12
15	110540	12	NUT ZN 8 DIN934	M8
21	**32652**	*)	ELEV. PIPE E L 1000 MM, S 1,5 MM	Incl. Parts 22-25
22	32528	2	TOP PLATE E L 1000 MM, S 1,5 MM	
23	32530	2	SIDE-PLATE E L 1000 MM, S 1,5 MM	
24	101800	20	BOLT 6K ZN 8.8 AM DIN933	M8X12
25	110540	20	NUT ZN 8 DIN934	M8
31	**32656**	*)	ELEV. PIPE E L 2000 MM, S 1,5 MM	Incl. Parts 32-35
32	22400	2	TOP PLATE E L 2000 MM, S 1,5 MM	
33	22401	2	SIDE-PLATE E L 2000 MM, S 1,5 MM	
34	101800	40	BOLT 6K ZN 8.8 AM DIN933	M8X12
35	110540	40	NUT ZN 8 DIN934	M8
41	**A72053**	1	PIPE WITH HOLES FOR THE ELEV. E L 1000 MM, S 2,0 MM	Incl. Parts 42-48
42	A72052	2	OPENING IN THE TOP PLATE E L 1000 MM, S 2.0 MM	
43	A72048	2	SIDE-PLATE E L 1,000 MM, S 2.0 MM	
44	32602	2	ELEV PIPE HOLE E S 1,5 MM	
45	101800	12	BOLT 6K ZN 8.8 AM DIN933	M8X12
46	101830	8	BOLT 6K ZN 8.8 AM DIN933	M8X25
47	110540	28	NUT ZN 8 DIN934	M8
48	115571	4 m	CELL PLASTIC TAPE INSEAL	4X10
51	101800	*)	BOLT 6K ZN 8.8 AM DIN933	M8X12
52	110540	*)	NUT ZN 8 DIN934	M8
53	32533	*)	ELEV INTERM. PL E	1 pc./2 m
55	41924	*)	ELEV PIPE EQUALLING FLANGE E S 2,0 MM	
61	**32535**	1	ELEVATOR SUPPORT ON THE DRYER (accessory)	Incl. Parts 62-67
62	32534	2	SUPPORT PLATE	
63A71383		3	SUPPORT ROD	
64	101820	14	BOLT 6K ZN 8.8 AM DIN933	M8X20
65	110540	14	NUT ZN 8 DIN934	M8
66	107720	4	SELF-TAPPING SCREW	4,8X13
67	111532	16	FENDER WASHER	M8

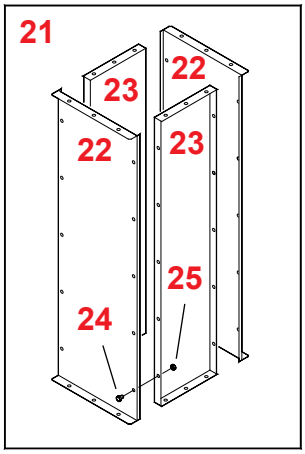
*) = Quantity as required

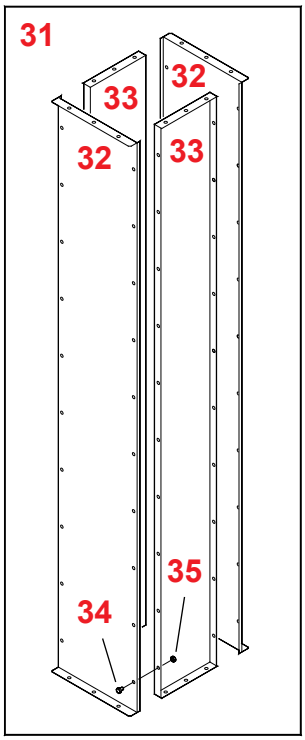
Parts for 2,0 mm elevator piping











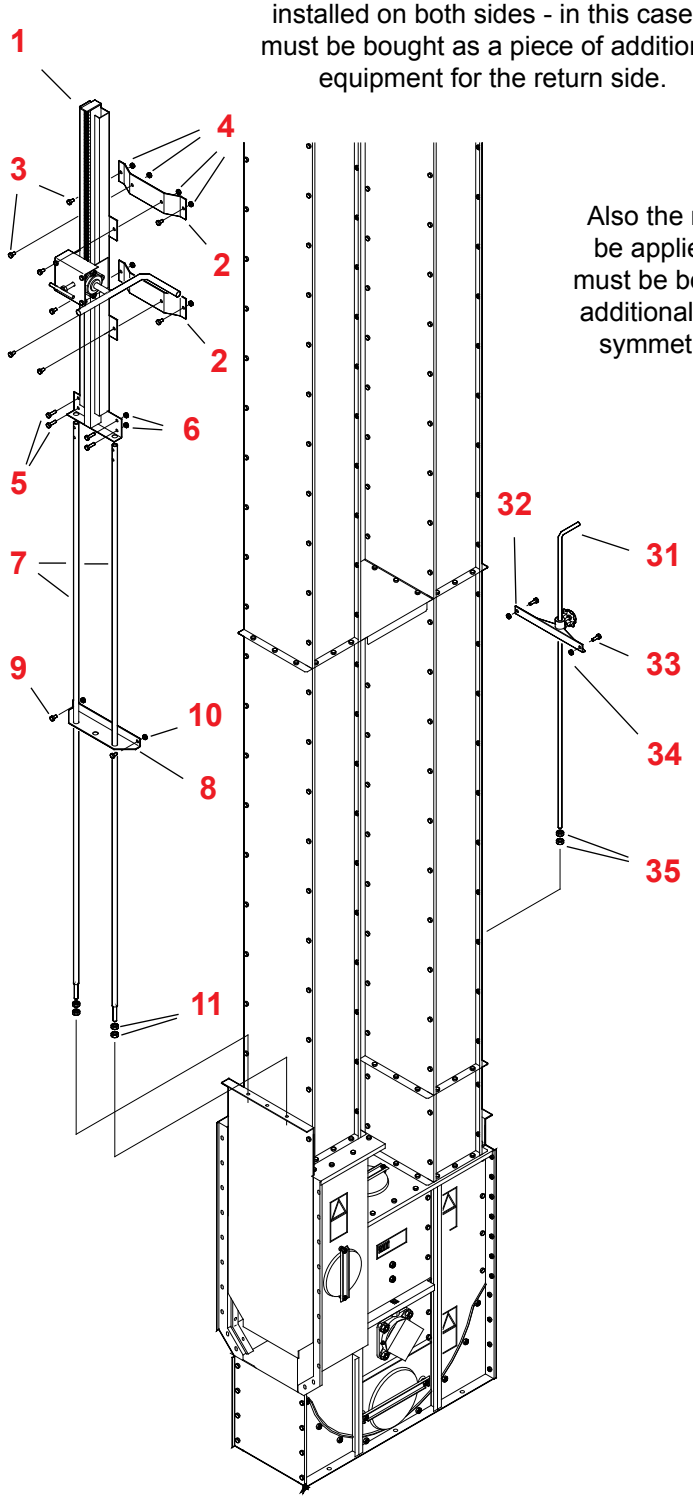
Height of the elevator exceeds 25 m

Ref.	Part	Pcs	Item	Note!
1	**A72040**	*)	ELEV. PIPE E L 350 MM, S 2.0 MM	Incl. Parts 2-5
2	A72041	2	TOP PLATE E L 350 MM, S 2.0 MM	
3	A72042	2	SIDE-PLATE E L 350 MM, S 2.0 MM	
4	101800	8	BOLT 6K ZN 8.8 AM DIN933	M8X12
5	110540	8	NUT ZN 8 DIN934	M8
11	**A72043**	*)	ELEV. PIPE E L 500 MM, S 2,0 MM	Incl. Parts 12-15
12	A72044	2	TOP PLATE E L 500 MM, S 2.0 MM	
13	A72045	2	SIDE-PLATE E L 500 MM, S 2.0 MM	
14	101800	12	BOLT 6K ZN 8.8 AM DIN933	M8X12
15	110540	12	NUT ZN 8 DIN934	M8
21	**A72046**	*)	ELEV. PIPE E L 1000 MM, S 2,0 MM	Incl. Parts 22-25
22	A72047	2	TOP PLATE E L 1,000 MM, S 2.0 MM	
23	A72048	2	SIDE-PLATE E L 1,000 MM, S 2.0 MM	
24	101800	20	BOLT 6K ZN 8.8 AM DIN933	M8X12
25	110540	20	NUT ZN 8 DIN934	M8
31	**A72049**	*)	ELEV. PIPE E L 2000 MM, S 2,0 MM	Incl. Parts 32-35
32	A72050	2	TOP PLATE E L 2000 MM, S 2.0 MM	
33	A72051	2	SIDE-PLATE E L 2,000 MM, S 2.0 MM	
34	101800	40	BOLT 6K ZN 8.8 AM DIN933	M8X12
35	110540	40	NUT ZN 8 DIN934	M8
41	**A72053**	1	PIPE WITH HOLES FOR THE ELEV. E L 1000 MM, S 2,0 MM	Incl. Parts 42-48
42	A72052	2	OPENING IN THE TOP PLATE E L 1000 MM, S 2.0 MM	
43	A72048	2	SIDE-PLATE E L 1,000 MM, S 2.0 MM	
44	32602	2	ELEV PIPE HOLE E S 1,5 MM	
45	101800	12	BOLT 6K ZN 8.8 AM DIN933	M8X12
46	101830	8	BOLT 6K ZN 8.8 AM DIN933	M8X25
47	110540	28	NUT ZN 8 DIN934	M8
48	115571	4 m	CELL PLASTIC TAPE INSEAL	4X10
51	101800	*)	BOLT 6K ZN 8.8 AM DIN933	M8X12
52	110540	*)	NUT ZN 8 DIN934	M8
53	32533	*)	ELEV INTERM. PL E	1 pc./2 m
55	41924	*)	ELEV PIPE EQUALLING FLANGE E S 2,0 MM	
61	**32535**	1	ELEVATOR SUPPORT ON THE DRYER (accessory)	Incl. Parts 62-67
62	32534	2	SUPPORT PLATE	
63	A71383	3	SUPPORT ROD	
64	101820	14	BOLT 6K ZN 8.8 AM DIN933	M8X20
65	110540	14	NUT ZN 8 DIN934	M8
66	107720	4	SELF-TAPPING SCREW	4,8X13
67	111532	16	FENDER WASHER	M8

*) = Quantity as required

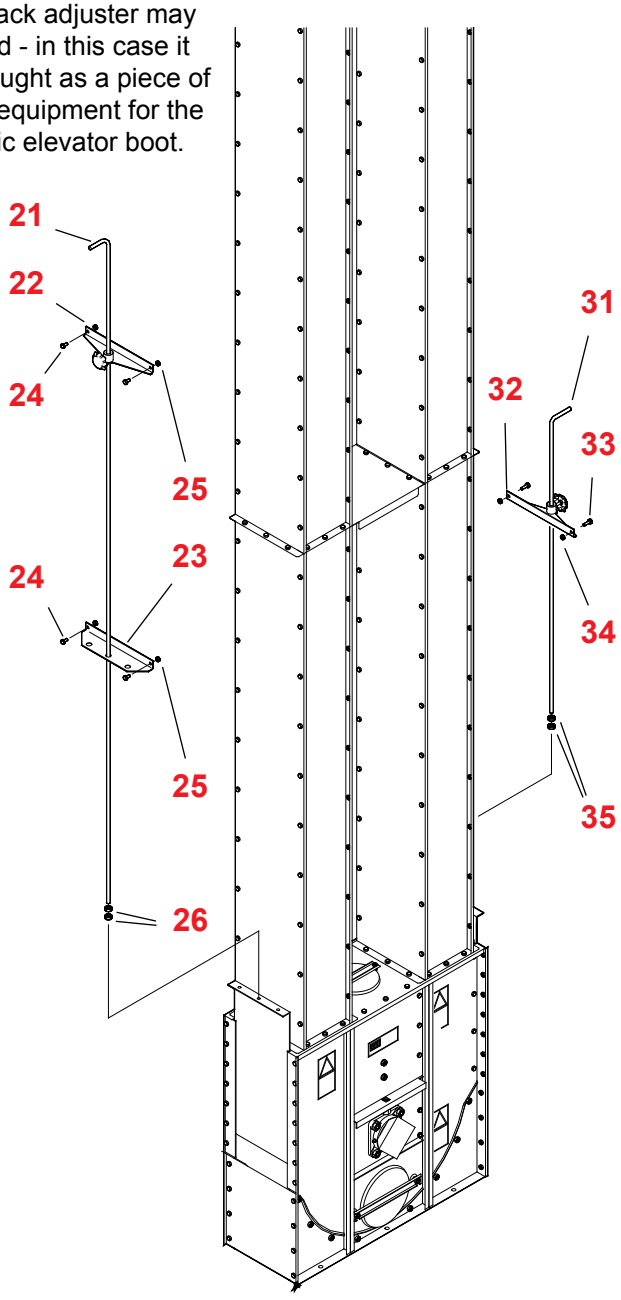
Adjustment parts for the shutter plates

As required, the rack adjuster can be installed on both sides - in this case it must be bought as a piece of additional equipment for the return side.



Elevated boot
ascending side return side

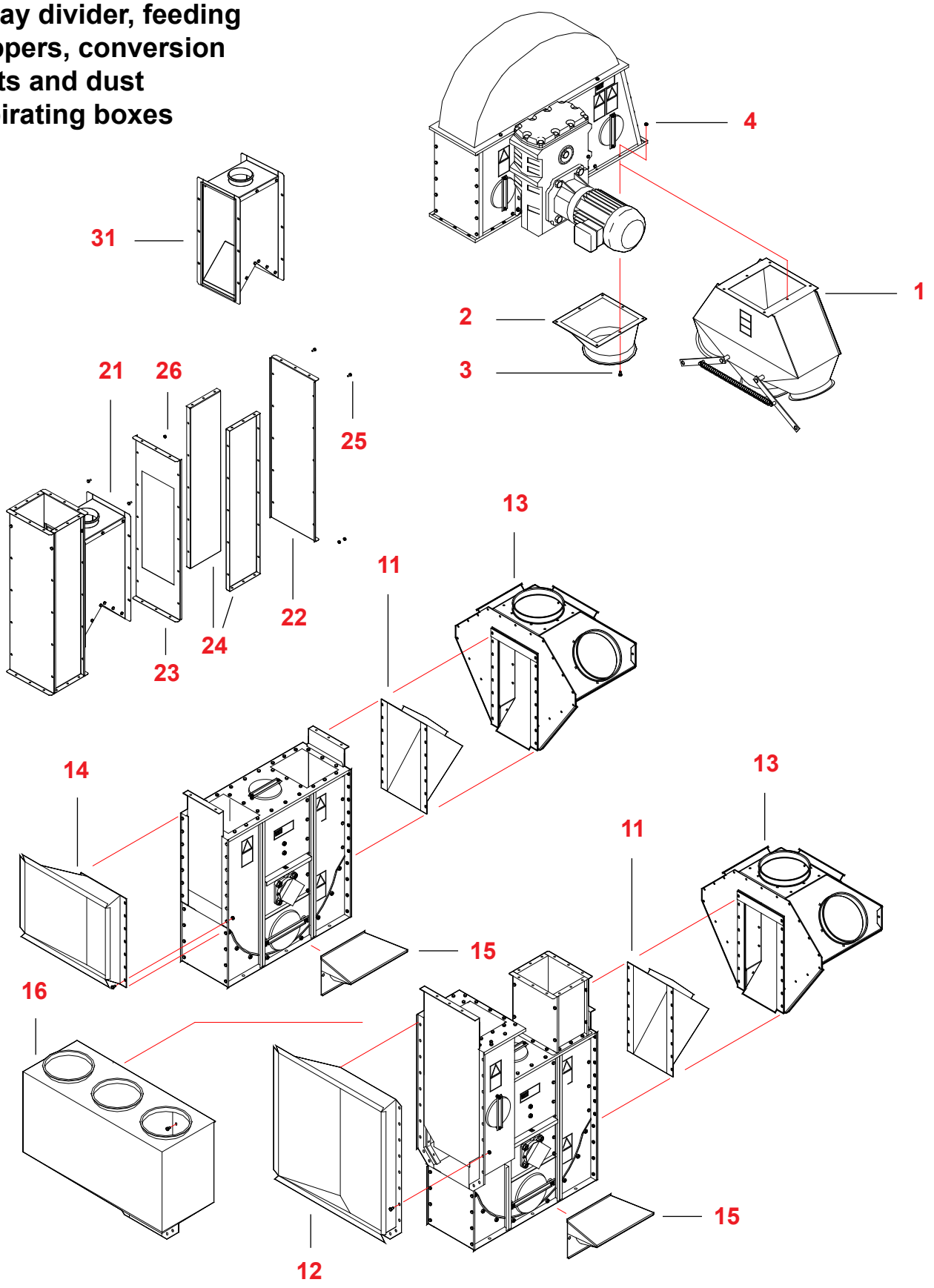
Also the rack adjuster may be applied - in this case it must be bought as a piece of additional equipment for the symmetric elevator boot.



Symmetric boot
ascending side return side

Ref.	Part	Pcs	Item	Note!
			Rack adjuster - elevated boot, ascending side	
1	510071	1	Rack adjuster	
2	41969	2	Bracket	
3	101805	8	Hexagon bolt	M8x16
4	110540	8	Hexagon nut	M8
5	101849	4	Hexagon bolt	M8x30
6	111501	4	Hexagon nut	M8
7	503513	2	Shutter plate rod	
8	41966	1	Guide	
9	101805	2	Hexagon bolt	M8x16
10	110540	2	Hexagon nut	M8
11	111502	4	Hexagon nut	M12
			Adjustment rod - symmetric boot, ascending side	
21	503510	1	Shutter plate handle - return side	L = 2750 mm
22	41967	1	Locking device	
23	41966	1	Guide	
24	101805	4	Hexagon bolt	M8x16
25	110540	4	Hexagon nut	M8
26	111502	2	Hexagon nut	M12
			Adjustment rod - both boot types, return side	
31	503511	1	Shutter plate handle - return side	L = 1250 mm
32	41967	1	Locking device	
33	101805	2	Hexagon bolt	M8x16
34	110540	2	Hexagon nut	M8
35	111502	2	Hexagon nut	M12

3-way divider, feeding hoppers, conversion parts and dust aspirating boxes



Ref.	Part	Pcs	Item	Note!
1	32616	1	3-way divider	
2	32526	1	Conversion part - top end (additional equipment)	250 mm
3	101805	6	Hexagon bolt	M8x16
4	110540	6	Hexagon nut	M8
11	A71986	1 (2)	Conversion part - boot	1 x D 250 mm
12	A71669	1	Intake spout - elevated boot	
13	A71971	1	Feeding hopper (additional equipment)	4 x D 250 mm
14	1941	1	Intake spout - symmetric boot	
15	503641	1	Intake spout on the side (additional equipment)	
16	1999	1	Front intake spout (additional equipment)	3 x D 250 mm
21	A70224	1	Dust aspirating box for E-elevator	L= 1000
22	32528	2	Elevator pipe, top cover	L= 1000
23	32603	2	Elevator pipe, top cover with opening	L= 1000
24	32530	4	Elevator pipe, side-plate	L= 1000
25	101810	46	Hexagon bolt	M8x16
26	110540	46	Hexagon nut	M8
-	505410	1	Dust aspirating box for E-elevator, assembly Incl. parts 21-26	
31	A70224	1	Dust aspirating box for E-elevator	

ASSEMBLING THE ELEVATOR

The installation of the elevator requires precision. The work must be carried out on different levels at various elevations. Therefore, in addition to installation skills, the work requires proper scaffolding and observation of safety issues.

All electrical installations must be carried out by an authorised electrician!

Definitions of the elevator parts

The definitions given in the chapter “Main parts of Antti E-Series elevator” are used in the following Installation Instructions.

Elevator Boot

Begin the installation of the E-series elevator by putting the elevator boot in place, as instructed in the installation plan. The boot of the elevated model has an expanded feeding opening and a big shutter plate on the ascending side. In the boot of the symmetric model the feeding openings and shutter plates are the same size on both sides.

The elevator boot must be installed on an even and level floor surface in a manner that the weight of the elevator is distributed evenly across the entire length of the elevator's underside.

* If the surface is not even it should be levelled by secondary casting, using steel plates or any other appropriate means.

Elevated boot

The elevator boot does not necessarily need to be fastened to this even base. However, it must be fastened to the filling hopper, which is built separately (see drawing. "Intake spout").

* To facilitate the construction of the hopper, the elevator delivery includes the front intake part. If the vertical wall of the hopper is made by casting or building up, the front intake part shall be used as a mould. In this case, the elevator boot and the intake spout attached to it should be fixed in place before building up or casting the wall.

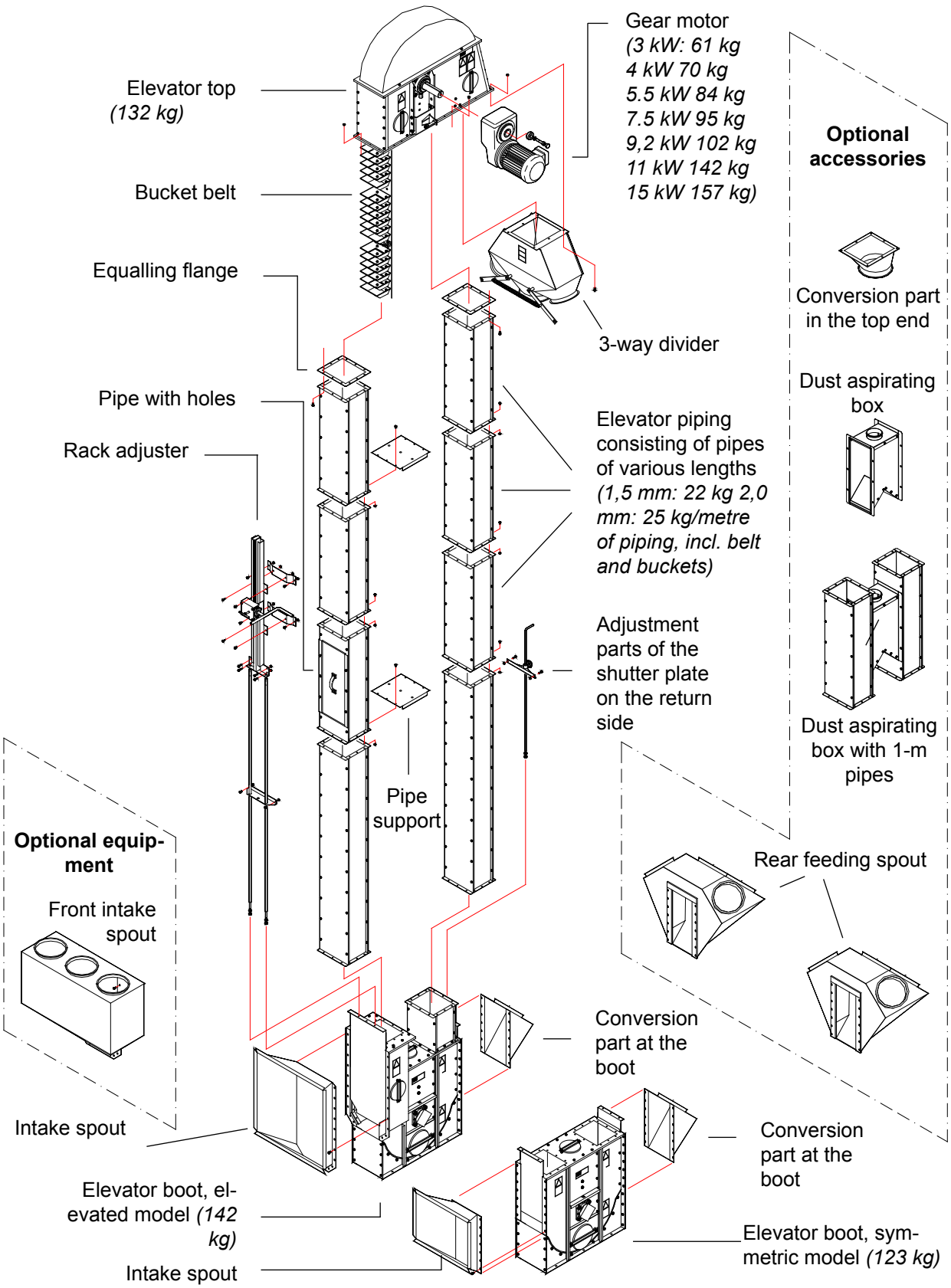
* Alternatively, the elevator boot front intake part can be attached to the concrete wall by means of secondary casting, provided that an installation hole with sufficient allowance is reserved when casting the wall.

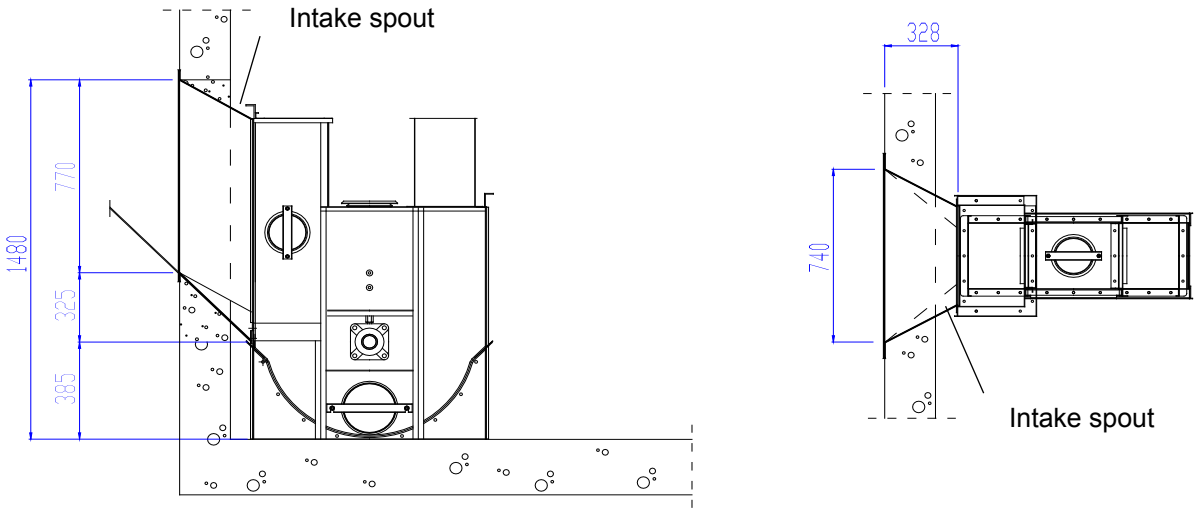
  Note! Before attaching the intake spout by casting or building up, ensure that all sides of the elevator boot are upright. Any obliquity has to be corrected by placing steel plates under the base of the elevator boot. If the elevator boot is not upright, it will be difficult to make the operation of the elevator smooth and noiseless.

  Note! After the casting of the intake spout has dried up, we recommend taking the following measures before

Elevator, E-series

Antti-elevator, E-series, main parts


Elevator top
(132 kg)
Bucket belt
Equalling flange
Pipe with holes
Rack adjuster
Gear motor
(3 kW: 61 kg
4 kW 70 kg
5.5 kW 84 kg
7.5 kW 95 kg
9,2 kW 102 kg
11 kW 142 kg
15 kW 157 kg)
3-way divider
Elevator piping consisting of pipes of various lengths (1,5 mm: 22 kg 2,0 mm: 25 kg/metre of piping, incl. belt and buckets)
Adjustment parts of the shutter plate on the return side
Pipe support
Optional accessories
Conversion part in the top end
Dust aspirating box
Dust aspirating box with 1-m pipes
Rear feeding spout
Optional equipment
Front intake spout
Intake spout
Conversion part at the boot
Conversion part at the boot
Elevator boot, elevated model (142 kg)
Intake spout
Elevator boot, symmetric model (123 kg)



Intake spout

tightening the bolts attaching the intake spout to the boot:

1. Raise the boot by placing metal sheets under it in order to make the lower edge of the intake part fit tight in the slot of the boot.

Put the shutter plates in place on both feed openings and check that the plates can be moved unobstructed in their grooves.

Frame pipes of the elevator

The frame pipes are manufactured in the following lengths: 0,35 m, 0,5 m, 1 m and 2 m.

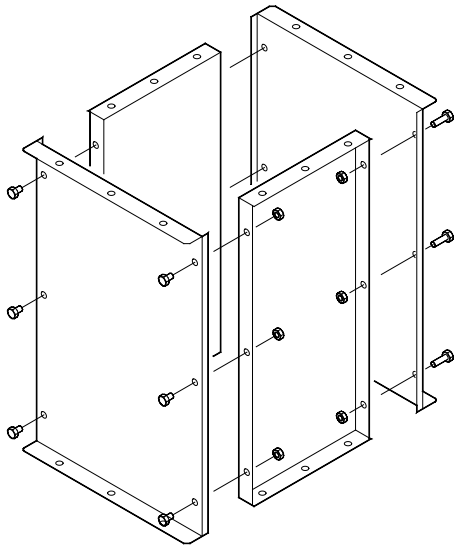
Assembly of the pipes

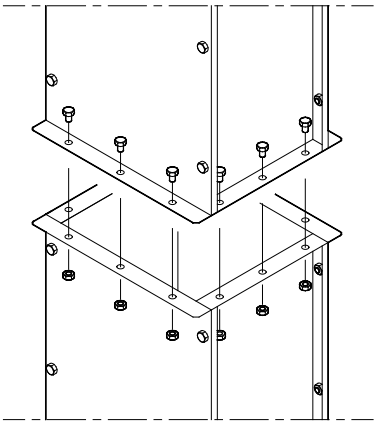
If the elevator pipes are delivered in parts, they must be assembled before installation. The sheet metal parts are packed in wooden frames, each frame containing the parts for two pipes of equal length.

Check the correct position of the pipes with respect to one another in the drawing "Assembling and joining up the frame pipes".

The number of M8x12 hexagon nuts and bolts required for one pipe is: 8 pcs for a pipe 0,35 m in length, 12 pcs for a pipe of 0,5 m, 20 pcs for a pipe of 1 m and 40 pcs for a pipe of 2 m.

Check the position of the sheet metal parts of the pipes with respect to one another so that the end flange of the pipe is straight before final tightening of the bolts.





Assembling and joining up the frame pipes

Elevator with elevated boot

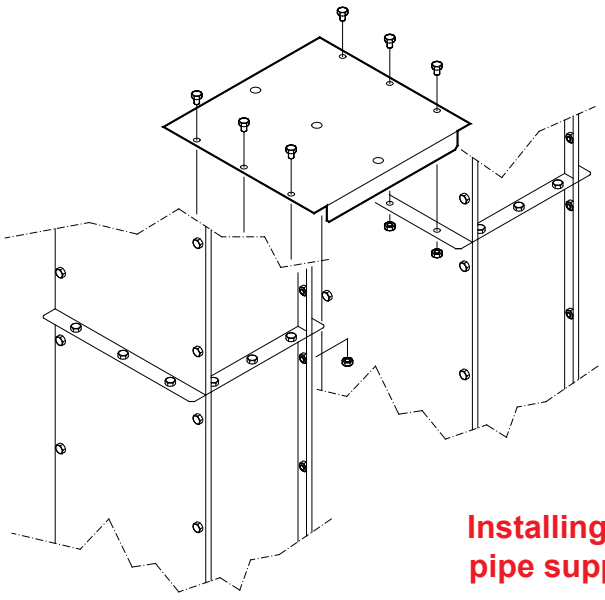
Fix at first a frame pipe 0,35 m in length on the return side of the elevator boot.

All elevators

Attach the 2-m long frame pipes to the cover plate of the elevator boot on the ascending and return sides (on elevators with symmetric boot), or a 2 m long pipe to the ascending side and a 0,35 m long pipe for extension of the frame pipe on the return side (elevators with elevated boot). Use hexagon nuts and bolts M8x12 for attachment (required number for each joint is 12 pcs.). See drawing "Assembling and joining up the frame pipes".

Installing the pipe supports

Place solid intermediate plates between the pipelines at intervals of 2-3 metres. See drawing "Installing the pipe support".



Installing the pipe support

Continue the assembly of the pipelines in a manner that the side-by-side pipes always are of equal length.

Fix the pipe with holes (1 m in length) on the ascending side, and an ordinary frame pipe of 1 metre in length next to it on the return side, to a position providing easy access for set-up and service work.

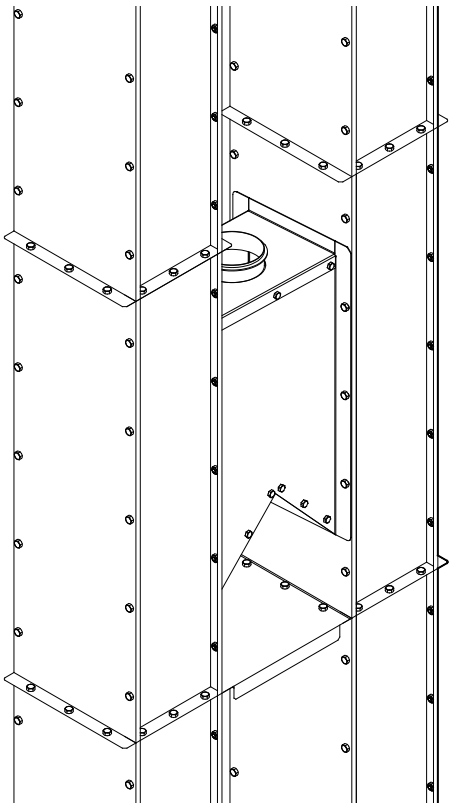
Dust aspirating box

Choose location for the dust aspirating box, placing it about 2/3 of the height of the piping measured from the bottom.

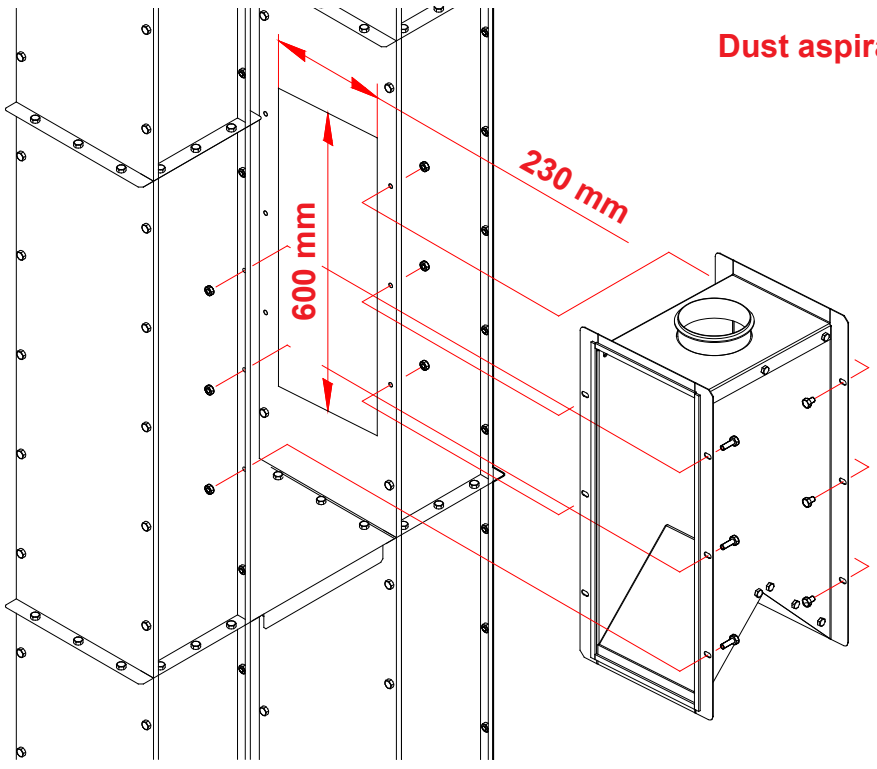
Install the dust aspirating box in the piping using the 1-m long pipes as any ordinary pair of 1-m long pipes.

For installation of the dust aspirating box, you need to cut first an opening of 230 mm x 600 mm on the inner sides of both pipes. Fix the box using the existing bolts in the elevator pipes. The flanges of the box are ready equipped with gaskets.

Dust aspirating box with 1-m pipes



Dust aspirating box without pipes



Operating the shutter plates

All elevators, return side

The shutter plate on the return side is fitted with a short handle (1250 mm). Install the locking device for the handle in the frame pipe on the return side for locking the shutter plate into position.

Fix the locking device in a position where the upper end of the handle comes close to the locking device, but does not restrict shutting of the plate even if the shutter plate were completely closed. Use two M8x16 bolts and nuts for attachment. See drawings "Actuators of the shutter plates, elevated boot" and "Actuators of the shutter plates, symmetric boot".

Elevator with elevated boot - ascending side

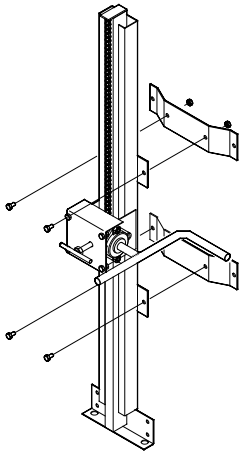
It pays to install the rack adjuster in the elevator in connection with the installation of the frame pipes.

Attach the rack adjuster first to its brackets using M18x16 bolts and nuts, and after that, attach the entire assembly to the side of the ascending pipe using four M8x16 screws and nuts after having removed first the four screws from the pipe at the corresponding location.

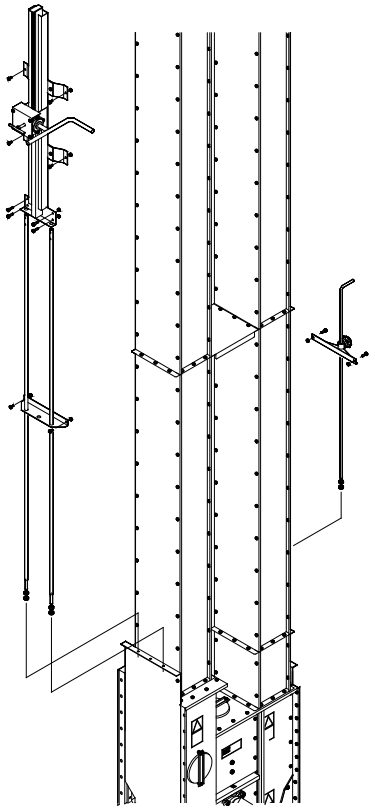
Select the location for the rack adjuster taking into account its easy operation from above the discharge hopper.

Attach the guide for the shutter plate rods to the side of the ascending pipe replacing two of the bolts in the pipe with nuts and bolts M8x16.

Rack adjuster brackets



Ascending side Return side



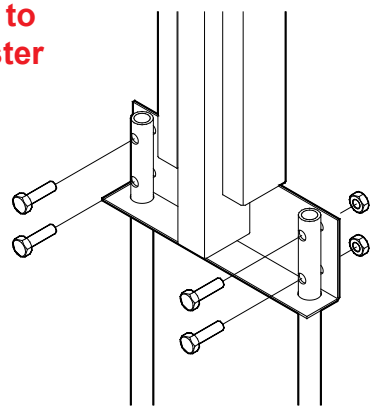
Actuators of the shutter plates, elevated boot

Shorten (or lengthen) the shutter plate rods to a suitable length. Drill horizontal holes (D 9-mm) in the upper ends of the rods. The attachment holes for the lifting bar at the lower end of the rack adjuster can be used as jigs during drilling (also see the drawing "Attaching the rods to the adjuster").

Fix the shutter plate rods in place. Thread the threaded lower end of the rod into the holes at the top edge of the shutter plate and tighten it on both sides using M10 nuts.

Fix the upper ends of the rods on the lifting rod of the rack adjuster using M8x30 bolts and nuts.

Attaching the rods to the adjuster



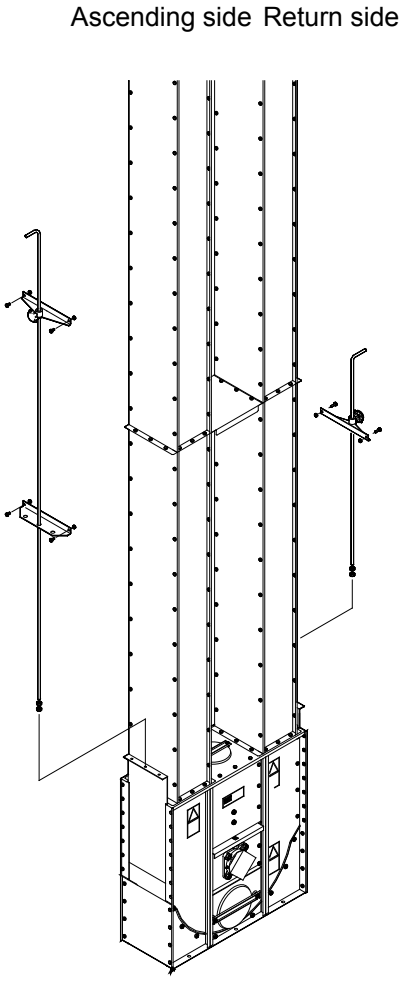
Elevator with symmetric boot - ascending side

Install one long shutter plate rod (2750 mm) on the ascending side. Install the locking device for the handle in the frame pipe on the ascending side for locking the shutter plate into position.

Fix the locking device in a position where the upper end of the handle comes close to the locking device, but does not restrict shutting of the plate even if the shutter plate were completely closed. Use two M8x16 bolts and nuts for attachment removing first two screws from corresponding location in the pipe.

Attach the guide for the shutter plate rod to the side of the ascending pipe, approximately in the middle of the rod using two M8x16 bolts and nuts removing first two screws from corresponding location in the pipe.

See drawing "Actuators of the shutter plates, symmetric boot".



Actuators of the shutter plates, symmetric boot

Evening out the height difference of the pipes

Level the top flanges of the frame pipes (+/-2,0 mm) before installing the top end. To offset any difference in height, 4 pcs of 2 mm thick shims are delivered with the dryer. Place a sufficient number of shims on top of the lower pipe before installing the top end of the elevator.

Elevator top

The elevator top is heavy, 132 kg without the gear motor.Use a hoist for lifting.

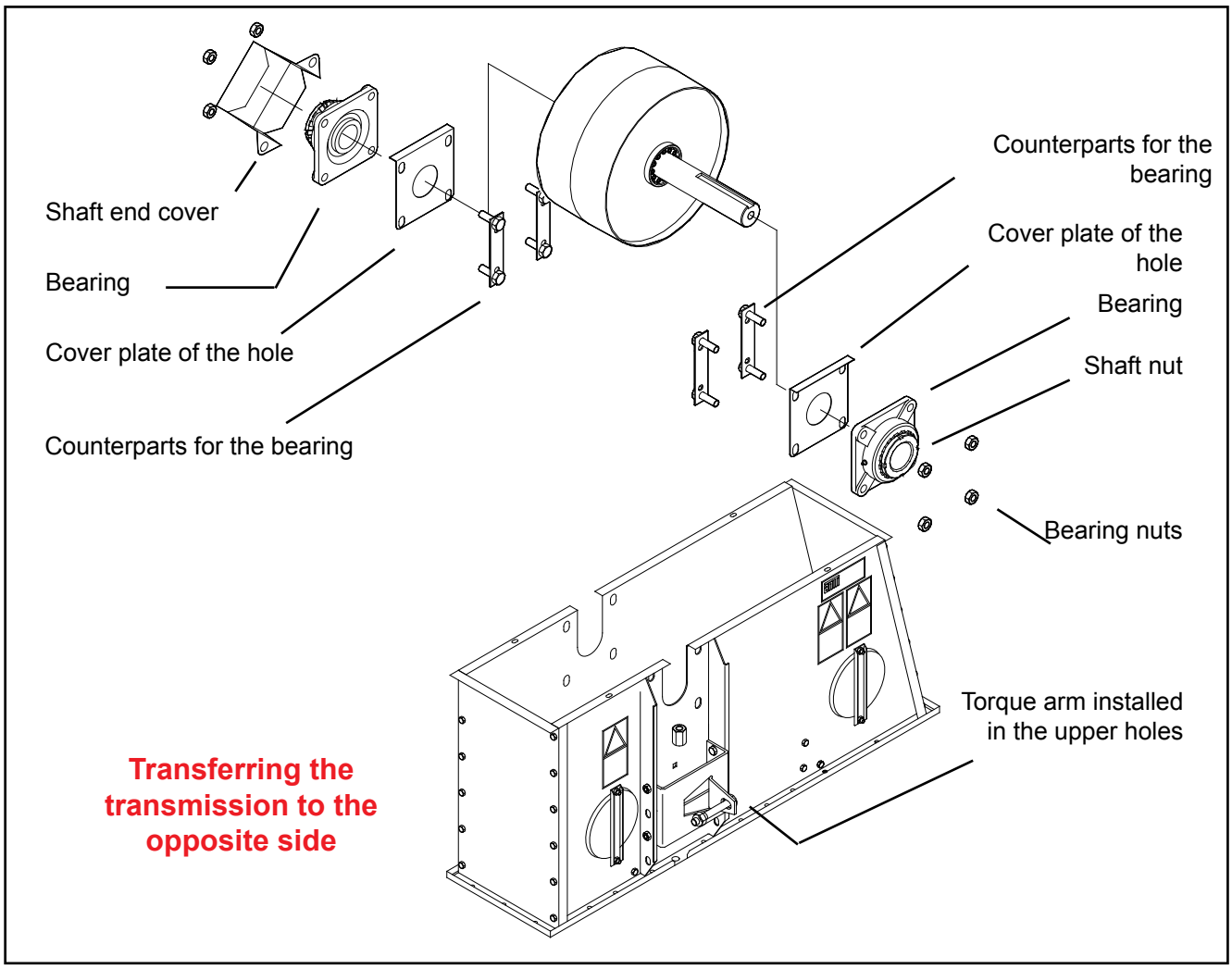
Transferring the transmission to the opposite side, if necessary

Sometimes the space is limited and the transmission must be transferred to the opposite side of the elevator top. This can be achieved by detaching the bearings of the bucket belt pulley shaft. See drawing "Transferring the transmission to the opposite side".

Remove the cover of the elevator top. Bend the locking clips of the shaft nuts from their grooves and loosen the shaft nuts which clamp the bearings to the shaft using a spanner wrench. Remove the bearing nuts and the shaft end cover. Remove the counterparts for the bearings from the inside. Pull out the bearings and the cover plates for the shaft holes on the outside from the shaft.

Lift up the shaft with the bucket belt pulley and turn the longer end of the shaft to the other side of the elevator top.

Put the cover plates for the shaft hole and the bearings back onto the shaft. Thread the counterparts for the bearings from inside through the side plates at the elevator top into the bearing holes. Fix the shaft end cover and the bearing nuts. Tighten the nuts initially. Wrench the nuts to their final tightness after having installed the bucket belt



Transferring the transmission to the opposite side

and carried out the height adjustment of the bearings.

Place the bucket belt pulley exactly in the middle with respect to the sides of the top end before tightening the shaft nuts. After tightening with a wrench spanner, lock the shaft nuts using the locking clips.

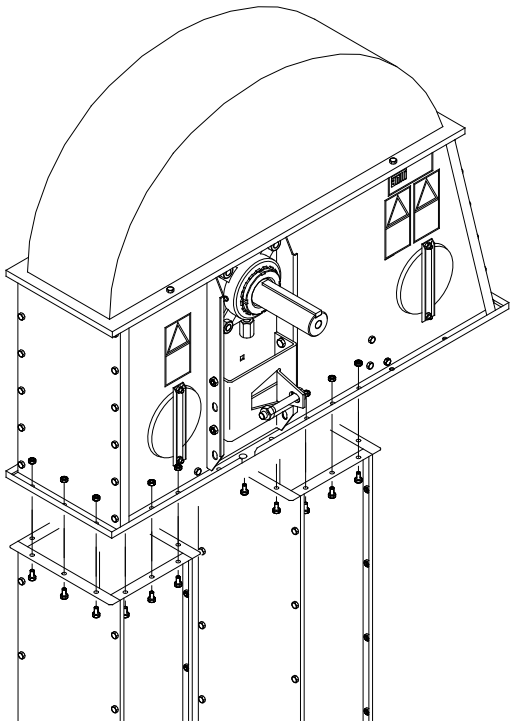
Transfer the torque arm for the gear motor to the upper holes on the same side as the shaft of the bucket belt pulley. Do not attach the top end cover until the bearings have been adjusted. Before this make sure that the bucket belt is running in the middle of the pulley. To control this, run the motor and carry out the fine adjustment using the hexagon socket adjustment screws under the bearing.

Attaching the top end to the frame pipes

Remove those of the attachment bolts for the bottom plate of the elevator top, which are also used for attachment of the upper flanges of the frame pipes to the bottom plate. See drawing "Installing the top end".

When lowering the elevator top onto the flanges of the frame pipes, direct it in place using suitable steel pins as guides. Doing so helps to align the holes in the flanges and the holes in the bottom plate of the top end.

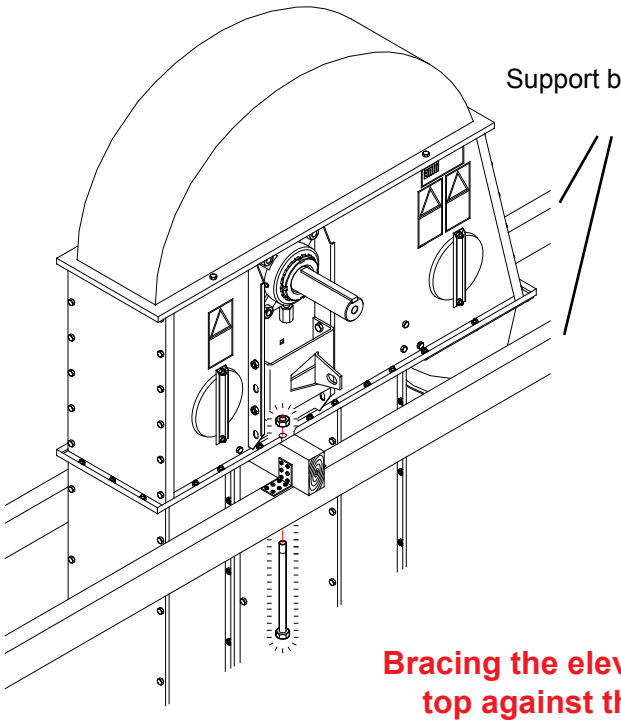
Put back in place and tighten the hexagon bolts and nuts which you recently removed. Note that you need to put your hand through the Ø121 mm hole in the bottom plate for putting the innermost bolts back in place. Six of the bolts must be installed this way.



Installing the top end

Checking the upright position and attachment of the elevator structure

Prop up the top end of the elevator by placing support battens (e.g. a 50 mm x 100 mm) under it and at the sides. The bottom flanges of the elevator top are provided with attachment holes for the battens. Fasten the beam by these holes using M16 nuts and bolts. See drawing "Bracing the elevator top inside the building".

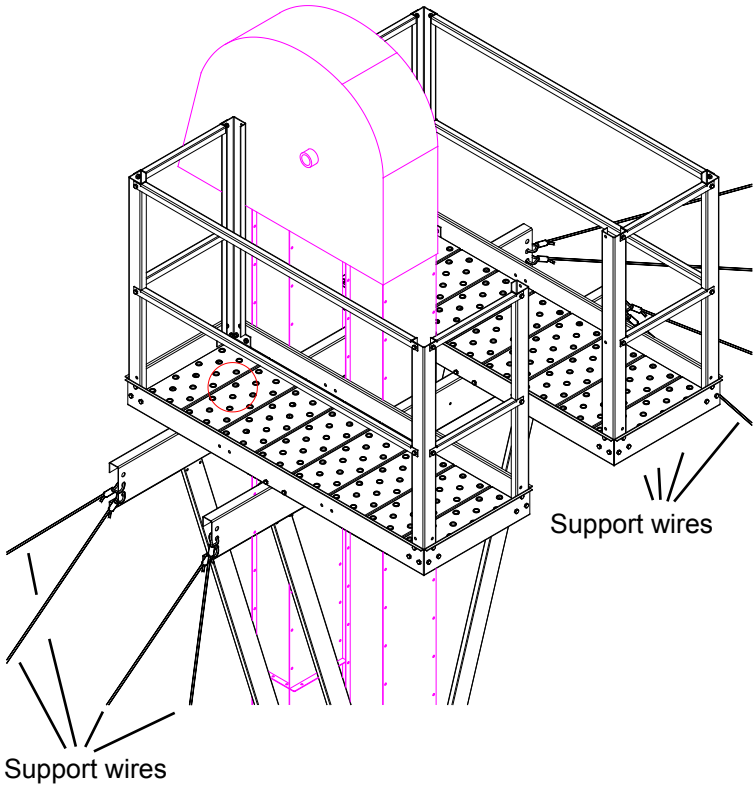


Bracing the elevator top against the building

If the elevator cannot be braced against the structures of the building as described above, it can be tied to the building or, if installed out of doors, to the ground using wire ropes. In every case the elevator top must be braced so firmly that the heavy gear motor cannot bend it.

Bring the elevator to an upright position using a plumb line as an aid.

Tighten the supporting structures **once the elevator stands upright**.



Wire ropes for supporting the elevator top

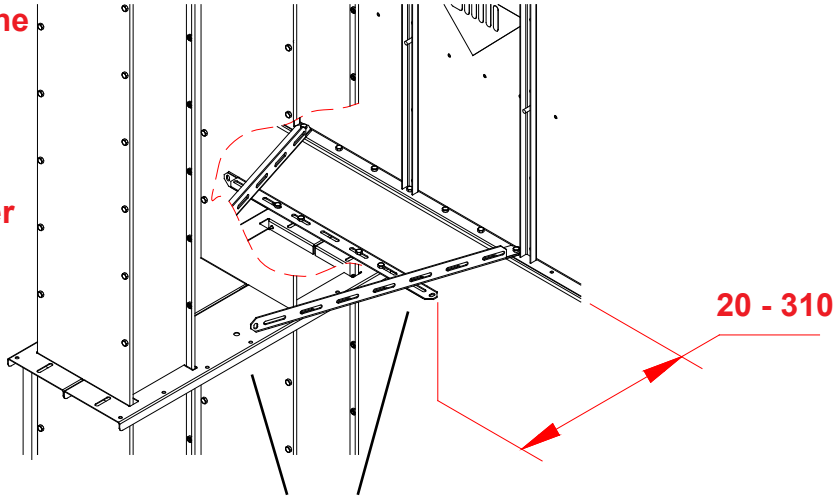
If the elevator is long, brace it also in the middle (at intervals of 5 - 6 metres).

ANTTI-TEOLLISUUS also delivers supports (32535) made of sheet metal for fixing the frame piping of the elevator on the ANTTI dryer (see drawing “Fixing the elevator on the Antti dryer”.

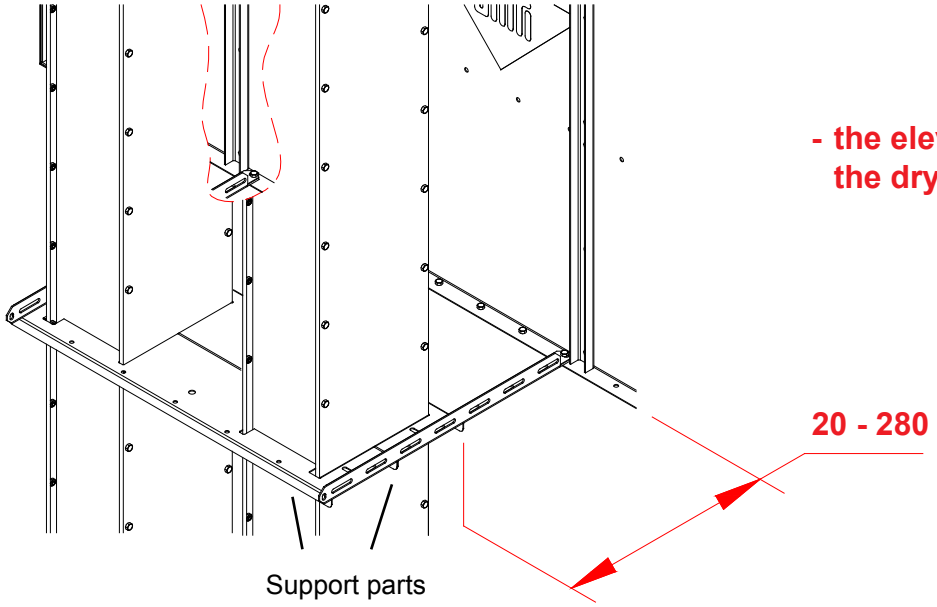
If the installation location does not enable the method described above to be applied, you can brace the elevator also in some other way.

Fixing the elevator on the Antti dryer

- the elevator lengthwise to the dryer



- the elevator transverse to the dryer

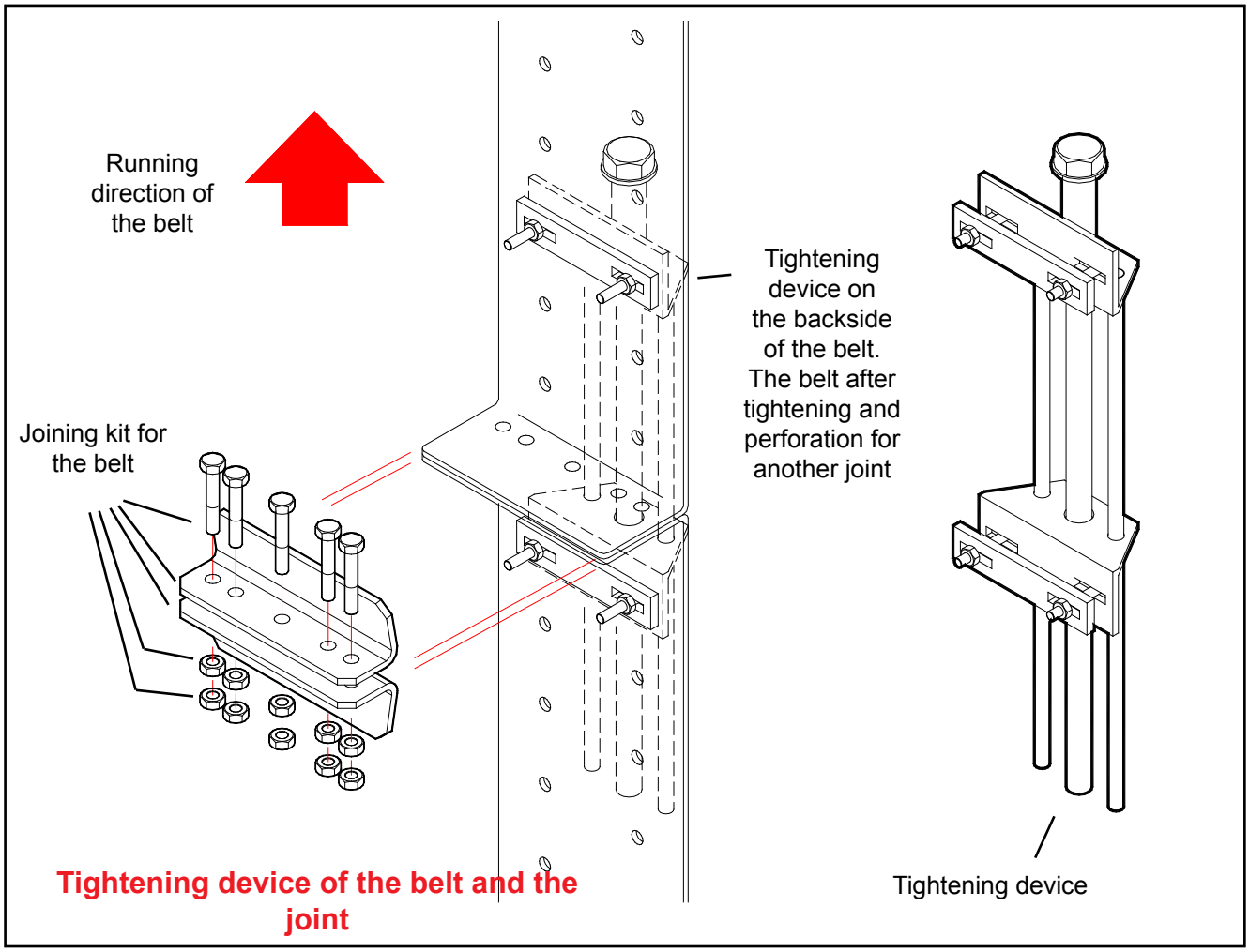


Bucket belt and buckets

Threading, tightening and joining the belt

NOTE! If the elevator belt is delivered in two parts, the delivery also includes two joining kits. Join first the belt parts together in accordance with the joining instructions below using one of the joining kits.

Lower the belt from above to both sides of the upper pulley in a manner that the side of the belt with thinner rubber layer (with respect to the reinforcement fabric) comes against the pulley. Pull the other end of the belt using a rope under the lower pulley to the opening in the pipe with plates. Fix the device for joining the belt included in the delivery to the belt screw holes on the backside of the belt. See drawing "Tightening device of the belt and the joint" Tighten the belt by wrenching the tightening device using a ratchet wrench. The tightness of the belt is correct when the attachment bolt holes for the buckets in the belt are slightly oval. Note, that tightening the belt too much strongly strains the elevator structure and thus shortens the service life of the machinery.


Running direction of the belt
Joining kit for the belt
Tightening device on the backside of the belt. The belt after tightening and perforation for another joint
Tightening device

Tightening device of the belt and the joint

Use the joining irons for joining the belt (see drawing "Tightening device of the belt and the joint"). Cut off the excess length from the belt so that the ends form a flap between the buckets. Install the bolts of the belt joining kit with their caps pointing in the direction of rotation of the belt in a manner that the bolt caps on the ascending side come on the upper side of the joining irons and the nuts come on the underside.

After removing the joining device, shine a light into the lower opening and look through the pipe from above to ensure that the belt is not twisted.

Attaching the buckets

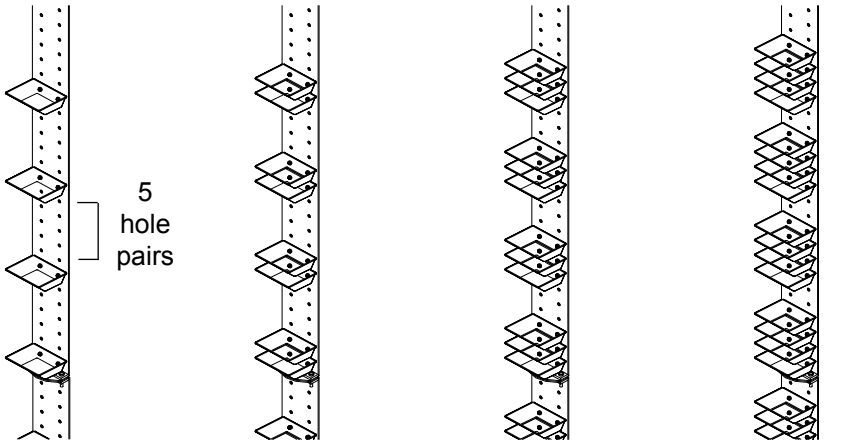
The buckets are usually attached to the belt through the hole in the pipe. M8x22 belt screws and Nyloc nuts are used for attachment. Tighten the nuts until the screw caps sink slightly into the rubber surface of the belt (i.e. the cap does not come in contact with the pulley). If it is difficult to wrench the Nyloc nuts tight at the pipe with holes (the bolts rotate), tighten the nuts initially on top of the upper pulley and wrench them to their final tightness at the the pipe with holes.

Retightening of the bucket belt

As required, the bucket belt shall be retightened by shortening the belt. The tightening device shall be used for retightening.
If the elevator is equipped with an adjustable boot (A72210), retightening can be carried out by means of the adjustment screws at the boot.

Check the alignment of the belt pulleys and the scrapers after retightening.

Installing the buckets of the E40 elevator E80



Elevators E40-E80

Install the buckets of the elevator with and without bottom in groups that span six attachment hole pairs of the bucket. Each group consists of the lowest bucket with bottom and of one to three buckets without bottom installed above it (E40 - 1 pc., E60 - 2 pcs., E80 - 3 pcs.). Leave one or several hole pairs unused above the bottomless buckets and below the next bucket with bottom.

If the last bucket group cannot be completed, because of the length of the belt, make sure one attachment hole pair is left unused below the next bucket with bottom by leaving out required number of bottomless buckets.

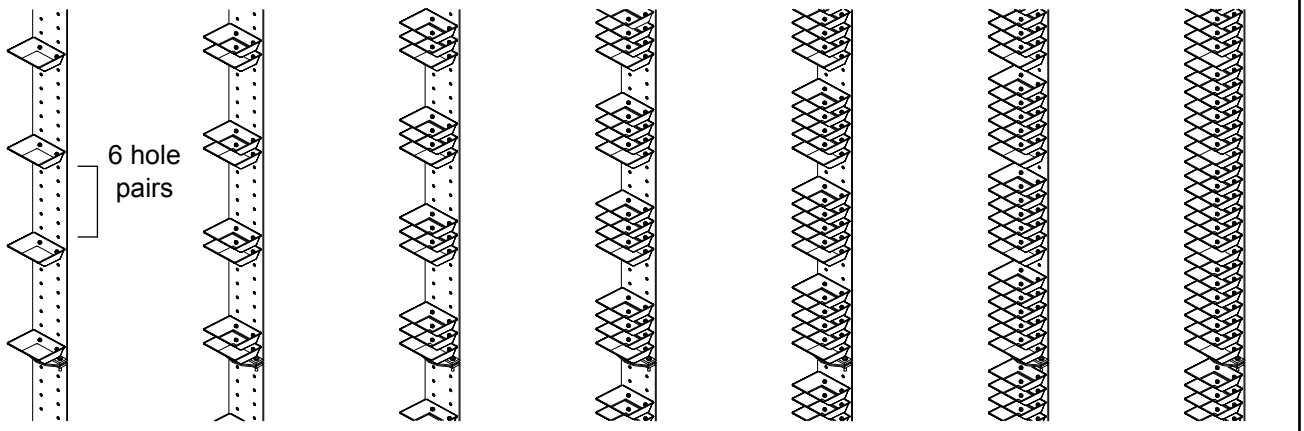
On the first installation round install buckets with bottom only. Install a bucket with bottom in every 6th pair of holes (see drawing: “Installing buckets in the E40-E80, after the 1st round"). On the second round install a bottomless bucket above each bucket with bottom. Repeat the installation rounds 2-4 times until there are from one (on E40) to three (on E80) bottomless buckets above each bucket with bottom. You can calculate the required amount of buckets if you know the total height of your elevator.

Required number of buckets with bottom is 2,22 pcs./metre of belt.
The number of bottomless buckets is 6,67 pcs./metre of belt on E80, 4,44 pcs./metre of belt on E60, 2,22 pcs./metre of belt on E40.

Elevators E100 ... E120

Install the buckets of the elevator with and without bottom in groups that span seven attachment hole pairs of the bucket. Each group consists of the lowest bucket with bottom and of five (E100) to six (E120) buckets without bottom installed above it. If the number of bottomless buckets is five, leave a pair of holes empty above the bottomless buckets below the next bucket with bottom.

Installing the buckets of the E100-E120 elevators


6 hole pairs
after the 1st round
after the 2nd round
after the 3rd round
after the 4th round
after the 5th round
after the 6th round, E100 ready
after the 7th round, E120 ready

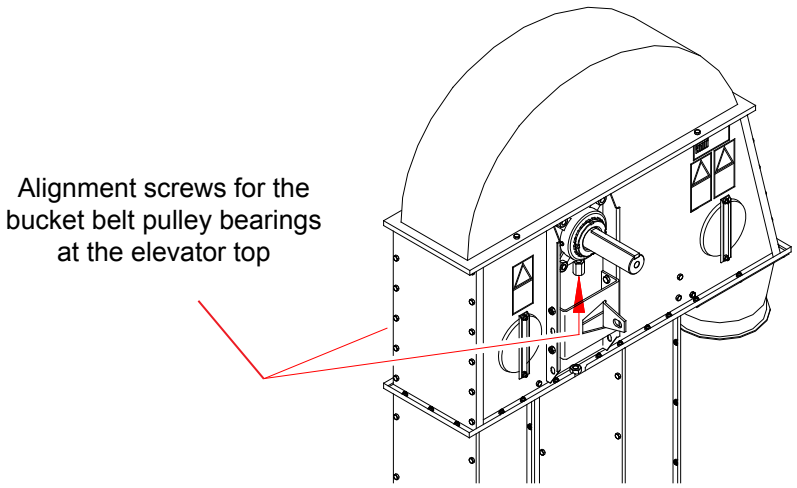
If the last bucket group cannot be completed, because of the length of the belt, make sure one attachment hole pair is left unused below the next bucket with bottom by leaving out required number of bottomless buckets.

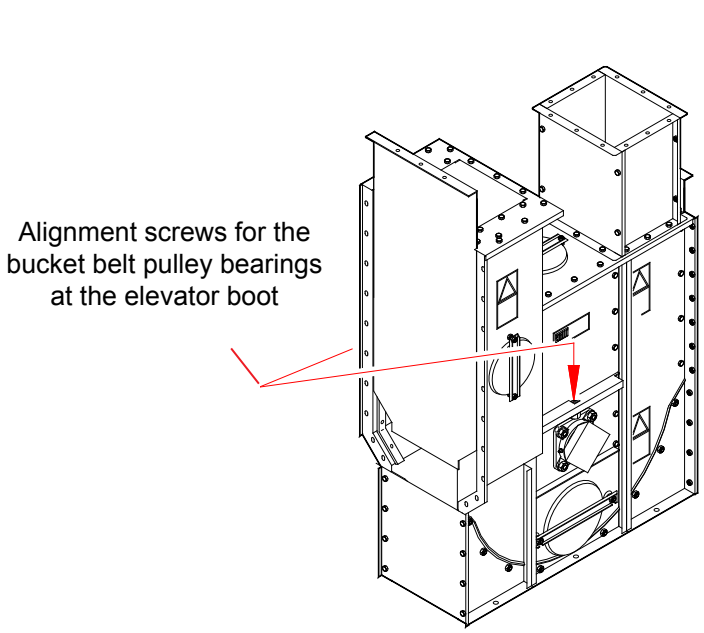
On the first installation round install buckets with bottom only. Install a bucket with bottom in every 7th pair of holes (see drawing: “Installing buckets in the E100-E120, after the 1st round"). On the second round install a bottomless bucket above each bucket with bottom. Repeat the installation rounds 6-7 times until there are from five (E100) to six (E120) bottomless buckets above each bucket with bottom. You can calculate the required amount of buckets if you know the total height of your elevator.

Required number of buckets with bottom is 1.9 pcs./metre of belt.
The number of bottomless buckets is 11,43 pcs./metre of belt on E120, 9,52 pcs./metre of belt on E100.

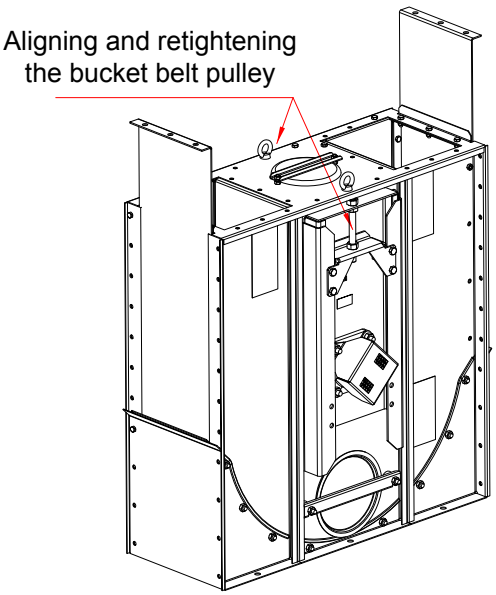
Aligning the bucket belt pulleys

Once the installation of the buckets is completed, check that the belt remains at the centre of the pulleys during the test rounds both at the top and the boot ends of the elevator. If the sides of top and boot ends of the elevator are exactly vertical, but the belt is running at the side of the pulley, loosen the attachment bolts of the bucket belt pulley bearings and adjust the position of the pulley using a hexagon socket key so that the belt shifts to the centre of the pulley. See drawing "Aligning the bucket belt pulleys".

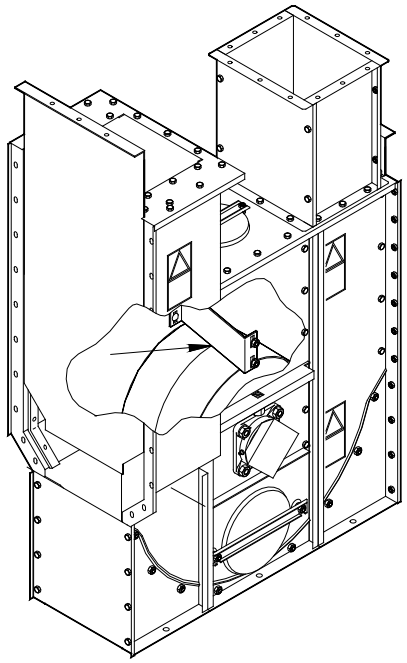




Aligning the bucket belt pulleys



Adjustable boot A72210



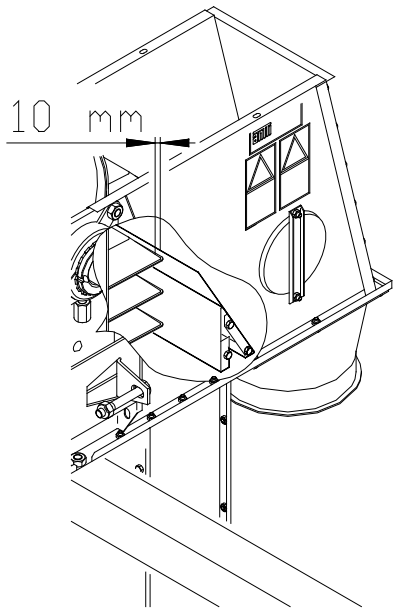
Setting the scrapers
(in the drawing the boot of the elevator)

Setting the scrapers

Adjust the scraper which rubs the surface of both bucket belt pulleys as close to the surface of the belt pulley as possible without causing any extra noise (see drawing "Setting the scrapers").

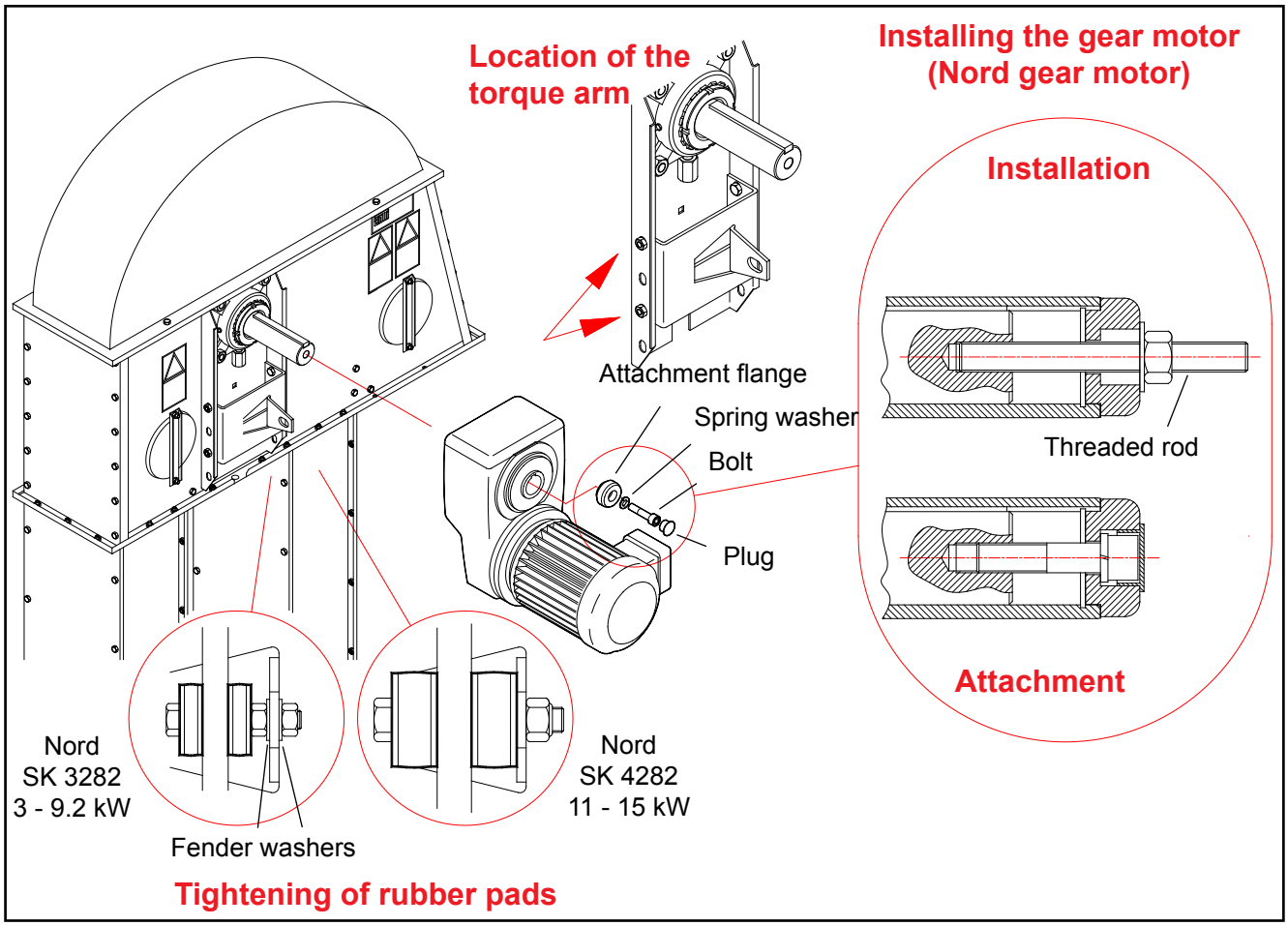
Setting the adjustment plate

Adjust the adjustment plate above the divider to a position where the buckets pass it at a distance of 10 mm (see drawing "Setting the adjustment plate").



Setting the adjustment plate

Installing the gear motor - Nord gear motor (standard configuration)



Lift the gear motor of the elevator level with the elevator top. Use a hoist for lifting as the gear motor, depending on its size, weighs 61 kg (3,0 kW), 70 kg (4,0 kW), 84 kg (5,5 kW), 95 kg (7,5 kW), 102 kg (9,2 kW), 142 kg (11 kW) tai 157 kg (15 kW). Lift the gear by the eye-bolts provided.

Check that the gear motor's torque arm is in position in the upper holes of the stiffener. See drawing "Installing the gear motor".

Clean the protruding part of the shaft in the top end of the elevator and place a key in the groove of the shaft.

Check the oil level in the gear motor through the control opening below the shaft (on the opposite side to the motor). When the gear motor is in the operating position, the oil surface must be level with the lower edge of the opening. See point "SERVICE"

Support the gear motor using a hoist and push it onto the shaft with the key on the shaft pointing towards the groove in the gear. You can use a M16 threaded rod, a large washer and a nut as aid while pushing the gear motor into position.. If the elevator shaft feels too tight for the sleeve shaft of the gear motor, check the alignment of the gear-head motor with respect to the shaft; do not hit (risk of bearing damage!). See the detail "Installation" in the drawing.

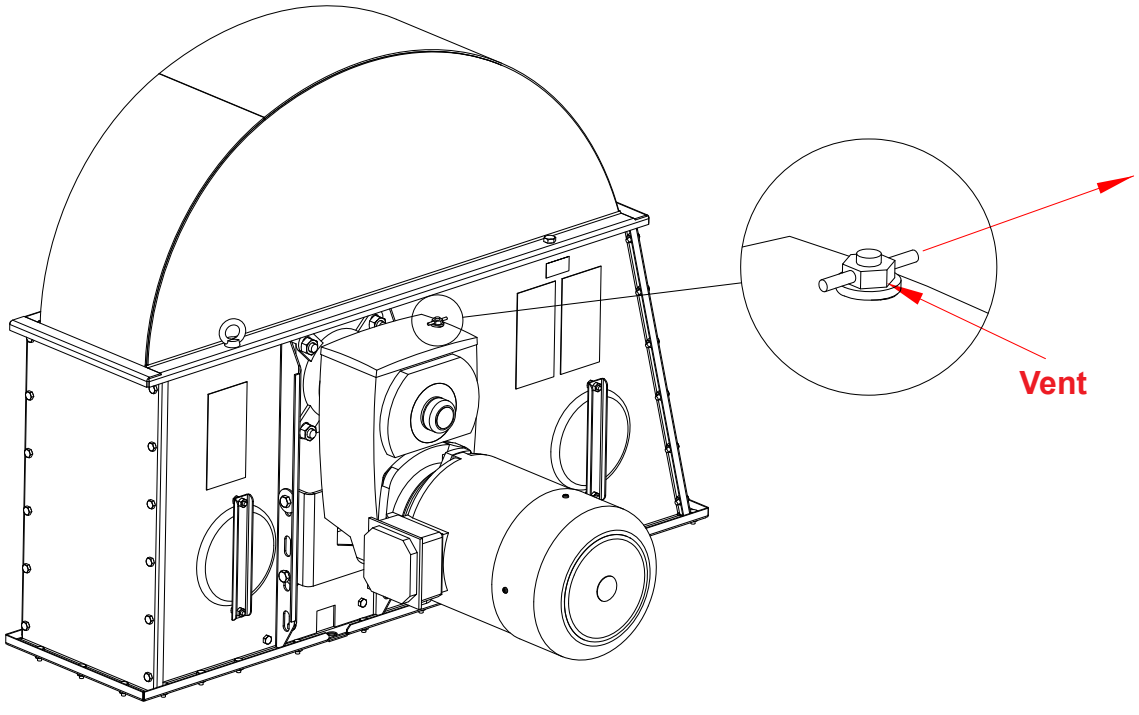
Press the gear motor into position and secure its attachment by installing the attachment kit delivered with the gear in the threaded bore of the shaft. The kit comprises an attachment flange, a spring washer, a hexagon socket bolt and a protective plug. The size of the bolt is M16x70. See the detail "Attachment" in the drawing. Tighten the bolt carefully.

Install simultaneously the rubber pads for the torque arm support on both sides of the gear housing bracket and fix the gear motor on the torque arm.

Attach the gear motors 3,0-9,2 kW by putting a hexagon bolt M12x80 into the hole in the rubber pad and tightening the nut so that the rubber pads are properly pressed against the bracket of the gear (see the point "Tightening the rubber pads, Nord SK 3282 3 - 9.2 kW"). Place M12 fender washers on both sides of the torque arm bracket. Finally, fasten the pad to the torque arm using another similar nut.

Attach the gear motors 11-15 kW by putting a hexagon bolt M16x110 into the hole in the torque arm and tightening the Nyloc nut so that the rubber pads are properly pressed against the bracket of the gear (see the point "Tightening the rubber pads, Nord SK 4282 11 - 15 kW").

Remove the rubber peg from the vent. (prevents spilling of the oil from the vent during transportation).



Removing the rubber peg from the vent

Electronic underspeed guard

(a standard piece of equipment if the control centre of the dryer is delivered later than 1.10.2002)

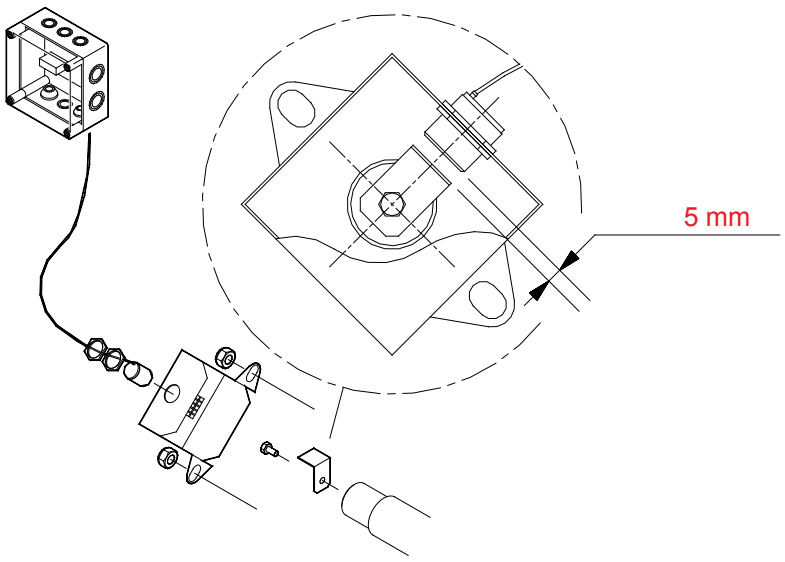
Install the underspeed guard in the elevator boot on the side where the possible side intake spout is used less frequently.

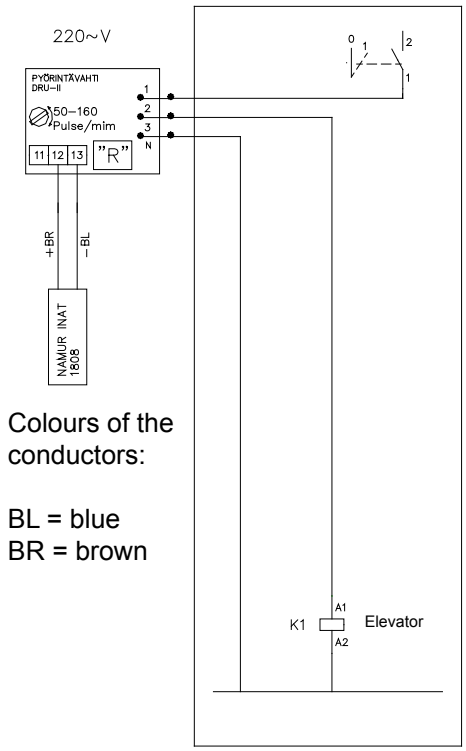
> The relay box for 230 V supply voltage is standard equipment in Finland.
> The relay box for 24 V supply voltage is standard equipment in Sweden.

The assembly proceeds as follows (drawing "Assembling and adjusting the electronic underspeed guard):

* Remove the shaft end cover from the device (if installed)
* Attach the claw-plate using an M8x16 hexagon bolt to the threaded hole in the shaft at the elevator boot. Make sure that one of the two claws has been shortened, i.e. the inductive sensor only records pulses at one of the claws.
* Install the inductive sensor in the cover casing of the shaft end leaving the sensor cable outside the casing. Place one of the attachment nuts for the sensor inside the casing and the other one outside the casing.
* Adjust the perpendicular distance from the sensor to the claw-plate to 5 mm. Tighten the nuts.
* Put the shaft end cover in place.
* Attach the relay box for the electronic underspeed guard either to the midmost side-plate of the elevator boot above the shaft end cover or to the dryer building structure within limits set by the length of the cable (do not extend the cable).
* Connections according to the diagrams (see next page). Also refer to the wiring diagram for the control centre of the dryer.

Assembling and adjusting the electronic underspeed guard





Colours of the conductors:

BL = blue
BR = brown

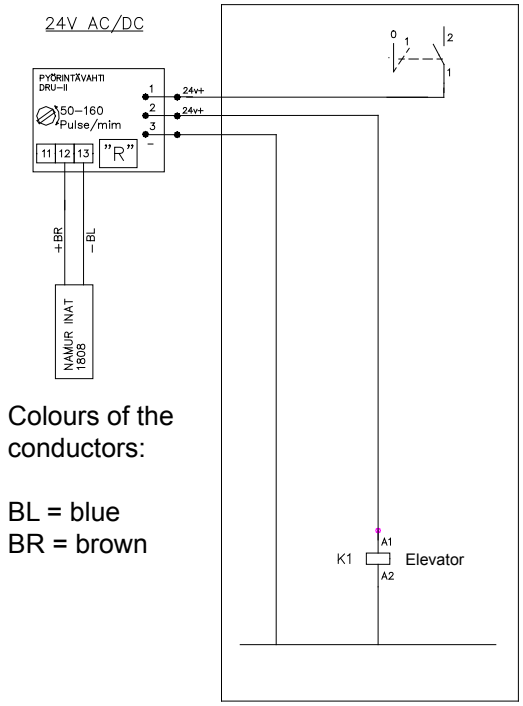
Operation

As the elevator is started, the relay "R" is active for nine seconds before the K1 is activated. The elevator must start during this period. Simultaneously, the sensor generates pulses, which make the relay "R" remain active. If the elevator is not running, generation of pulses stops. After this both relays "R" and K1 will be deactivated and the elevator stops. If the underspeed guard has stopped the elevator, you can restart it by turning the operating switch into position "0".

Signal lights in the relay box

Power ON	O	The LED is illuminated if the supply voltage is connected to the relay box
Pulse Input	O	The LED flashes if the sensor is generating pulses
Run OK	O	The LED is illuminated if the pulse rate generated by the sensor is correct.
I.time ON	O	The LED is illuminated for 9 seconds during the start-up delay. The light goes out as soon as the system is switched to Run OK mode.

Wiring diagram for the electronic underspeed guard (220V)



Colours of the conductors:

BL = blue
BR = brown

Operation

As the elevator is started, the relay "R" is active for nine seconds before the K1 is activated. The elevator must start during this period. Simultaneously, the sensor generates pulses, which make the relay "R" remain active. If the elevator is not running, generation of pulses stops. After this both relays "R" and K1 will be deactivated and the elevator stops. If the underspeed guard has stopped the elevator, you can restart it by turning the operating switch into position "0".

Signal lights in the relay box

Power ON	O	The LED is illuminated if the supply voltage is connected to the relay box
Pulse Input	O	The LED flashes if the sensor is generating pulses
Run OK	O	The LED is illuminated if the pulse rate generated by the sensor is correct.
I.time ON	O	The LED is illuminated for 9 seconds during the start-up delay. The light goes out as soon as the system is switched to Run OK mode.

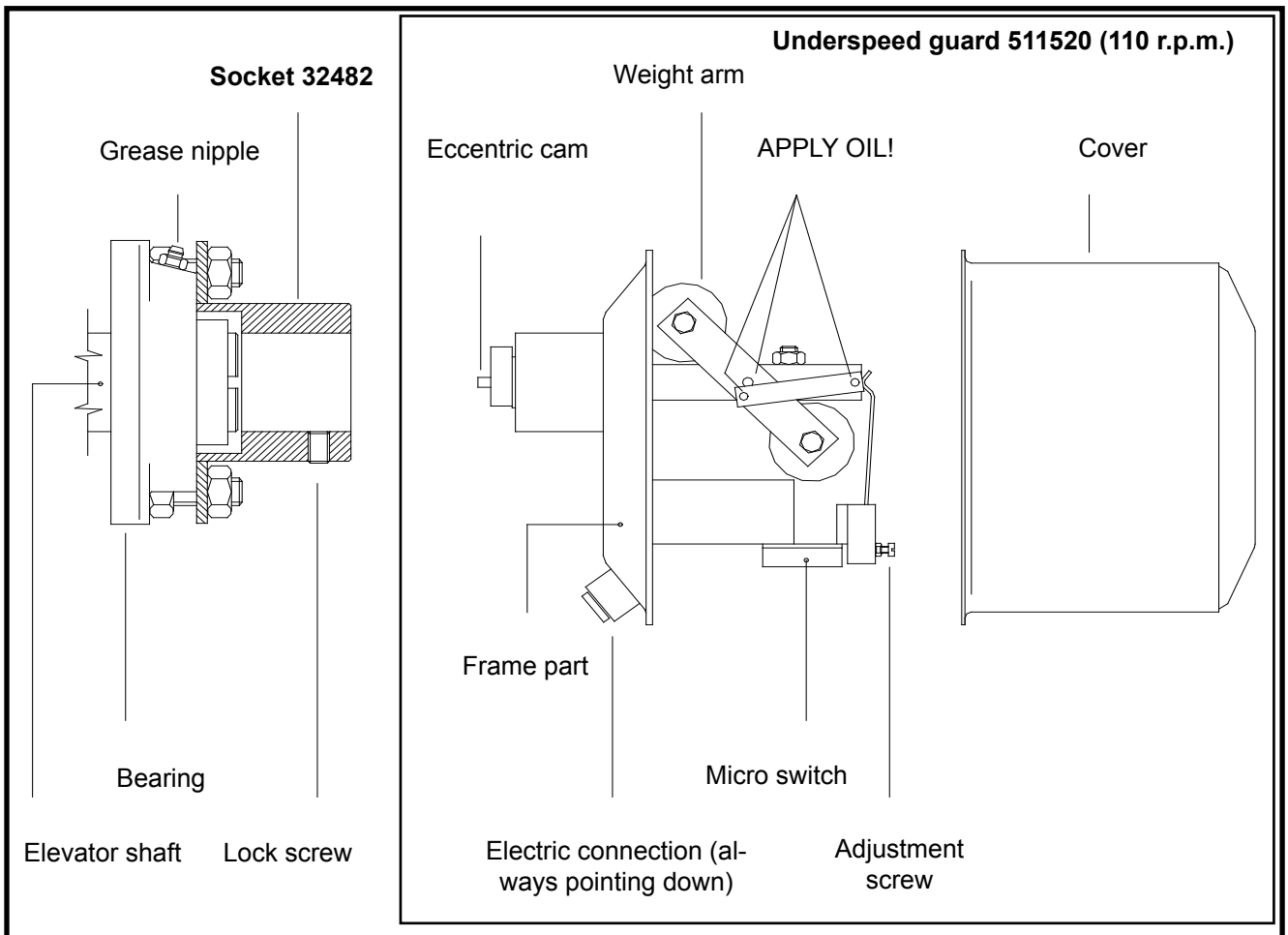
Wiring diagram for the electronic underspeed guard (24V)

Mechanical underspeed guard (110 r.p.m., part 511520)

(a standard piece of equipment if the control centre of the dryer is delivered earlier than 1.10.2002)

Install the underspeed guard in the elevator boot on the side where the possible side intake spout is used less frequently. The assembly proceeds as follows (drawing "Assembling and adjusting the underspeed guard):

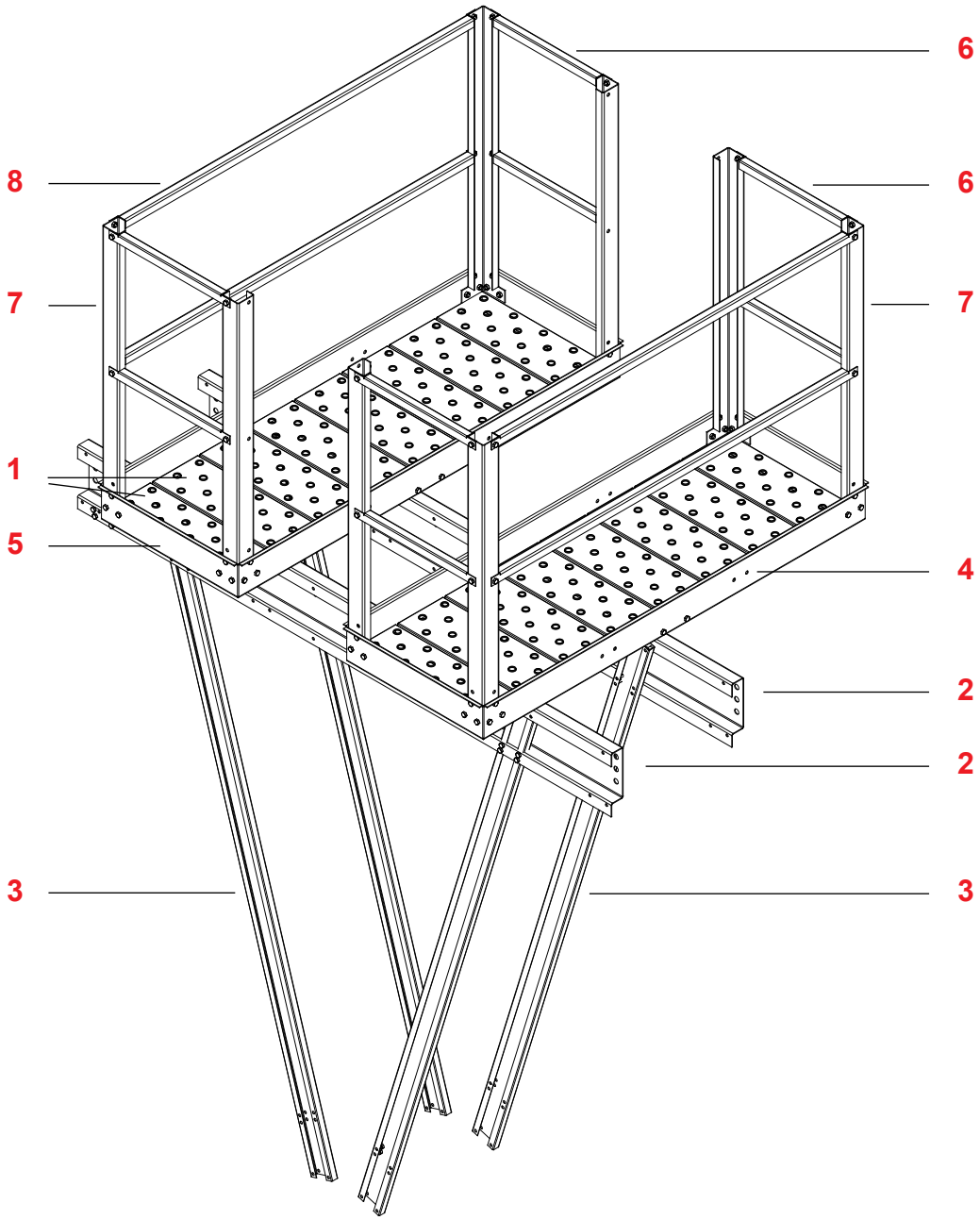
* Attach the socket to the bolts of the elevator bearing. Tighten the attachment nuts for the socket initially finger tight.
* Apply oil to the groove in the end of the belt pulley shaft.
* Remove the cover for the underspeed guard and connect its frame-part to the socket. Direct the electric connection of the underspeed guard downward. Ensure that the eccentric cam is in the groove in the end of the shaft.
* Press the frame-part to as far as it goes (shaft against shaft) and pull it back about 1 mm. Tighten the lock screw (M8 hexagon socket).
* Rotate the shaft in order to centre the attachment of the underspeed guard socket Tighten the lock nuts for the socket
* Apply oil to the middle shaft of the weight arm and the joints of the adjustment arms. Install the cover and the cover band so that the bolt comes on the underside.



Assembling and adjusting the underspeed guard

ANTTI-ELEVATOR, E-SERIES, PARTS DRAWINGS OF ADDITIONAL EQUIPMENT

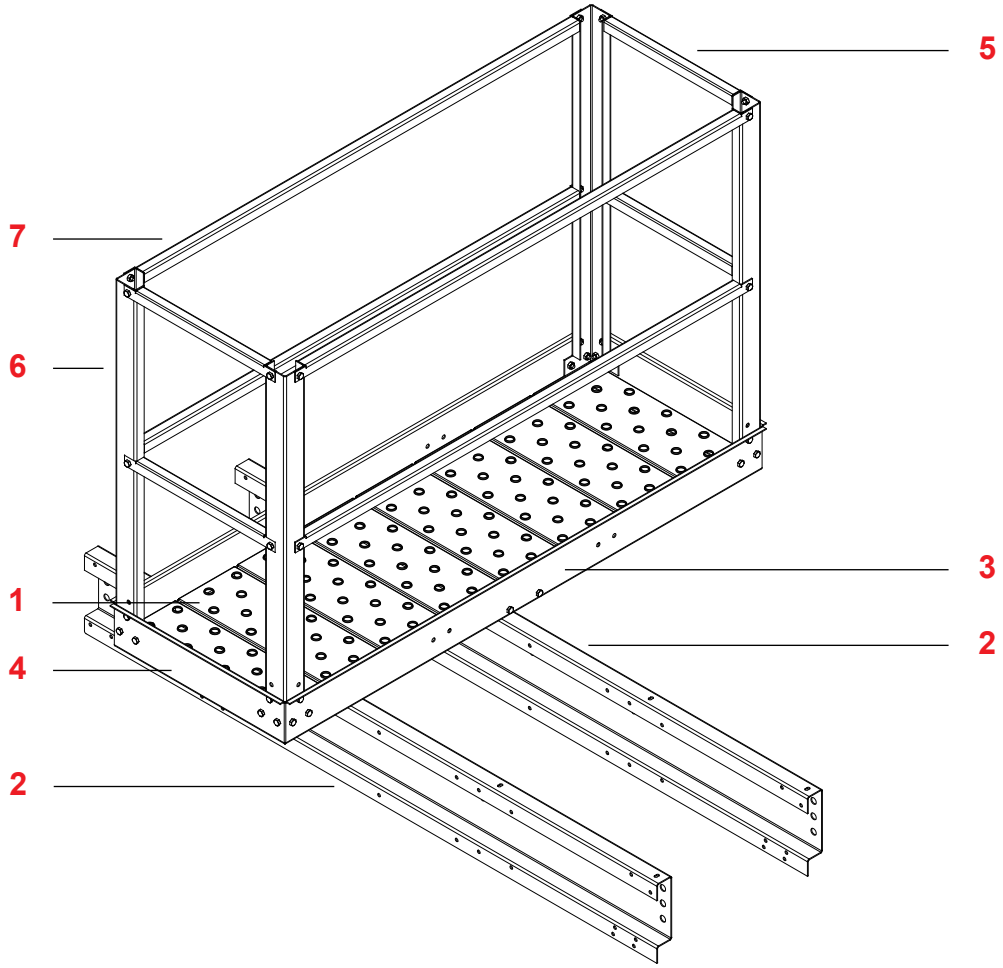
2-sided service platform (33355), spare parts drawing



20080101

Ref.	Part no.	Denomination	Pcs	Dwg. No.	Weight
1	A71545	Platform element for elevator 215 x 635 x 35	16	A71545-A	2.35
2	33338	Mega cladding, frame beam, service platform for elevator	2	33338-B	20.34
3	33339	Mega cladding, cross-brace, service platform for elevator	4	33339-0	5.93
4	33340	Mega cladding, kicking plate 1786, service platform for elevator	4	33340-B	8.34
5	33341	Mega cladding, kicking plate 637, service platform for elevator	4	33341-0	2.94
6	33343	Mega cladding, handrail 565, service platform for elevator	8	33343-A	0.72
7	32587	Mega cladding, corner post, handrail, upper level	8	32587-A	5.48
8	32583	Mega cladding, handrail 1632, service platform for elevator	4	32583-0	3.60
9	110560	Hexagon nut M10 DIN934	134		0.01
10	102200	Hexagon bolt ZN M10x20 DIN933	122		0.02

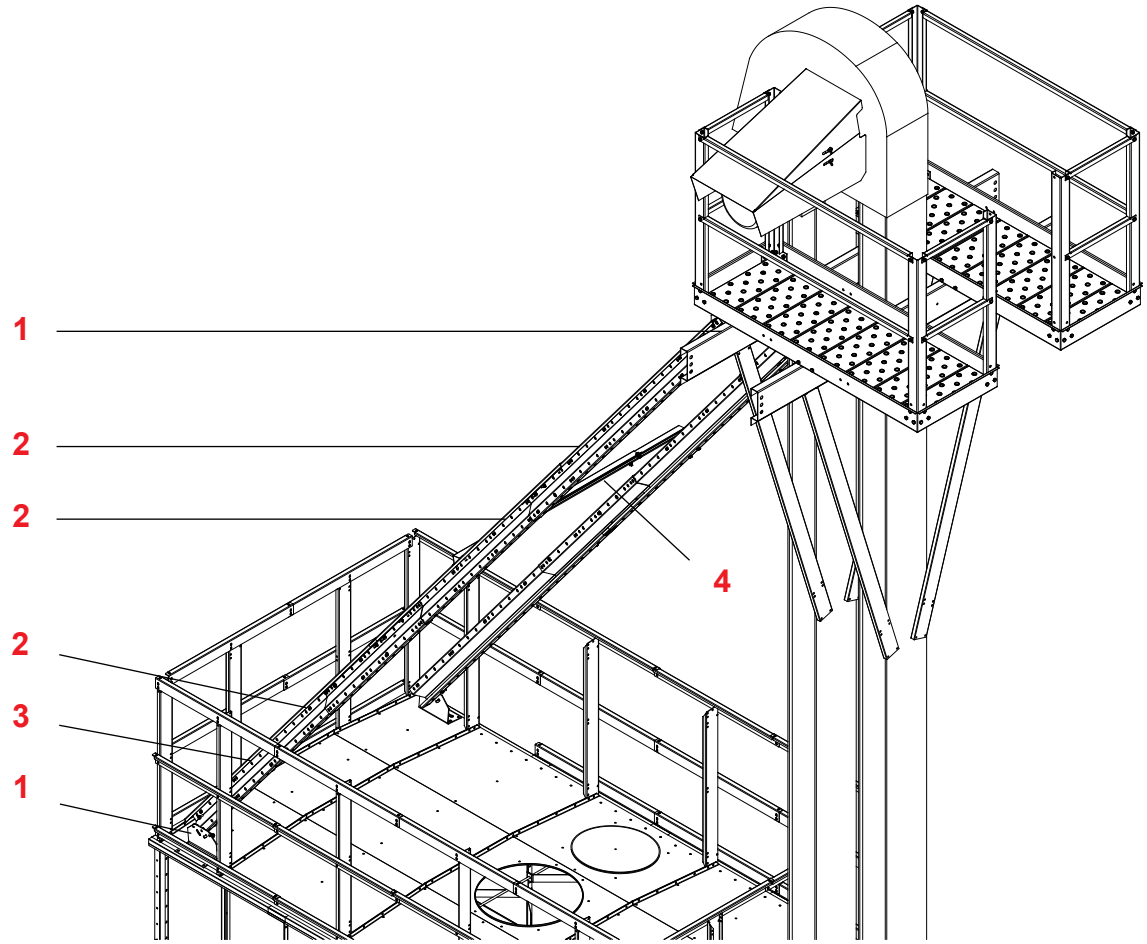
1-sided service platform (33356), spare parts drawing



20080101

Ref.	Part no.	Denomination	Pcs	Dwg. No.	Weight
1	A71545	Platform element for elevator 215 x 635 x 35	8	A71545-A	2.35
2	33338	Mega cladding, frame beam, service platform for elevator	2	33338-A	16.95
3	33340	Mega cladding, kicking plate 1786, service platform for elevator	2	33340-B	8.34
4	33341	Mega cladding, kicking plate 637, service platform for elevator	2	33341-0	2.94
5	33343	Mega cladding, handrail 565, service platform for elevator	4	33343-A	0.72
6	32587	Mega cladding, corner post, handrail, upper level	4	32587-A	5.48
7	32583	Mega cladding, handrail 1632, service platform for elevator	4	32583-0	3.60
8	102200	Hexagon bolt ZN M10x20 DIN933		61	0.02
9	110560	Hexagon nut M10 DIN934		68	0.01

Elevator support (A71950P), spare parts



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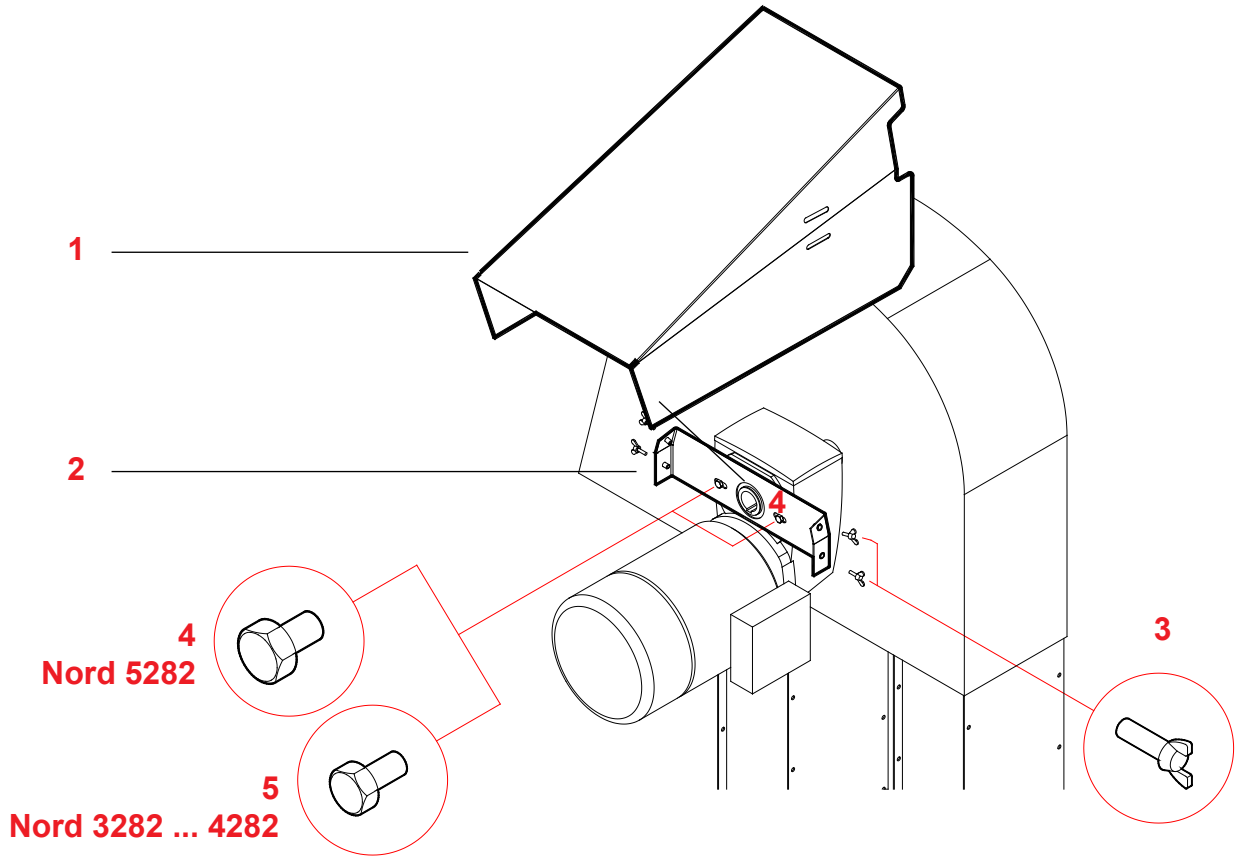
Ref.	Part no.	Denomination	Pcs	Dwg. No.	Weight
1	A71918	Elevator support, cover, upper bracket, E-model WM06	4	A71918-A	1.76
2	A71919	Cladding Z-beam L = 2500 WM06	6	A71919-0	14.79
3	A71916	Cladding Z-beam L = 1250 WM06	2	A71916-0	7.38
4	A71917	Elevator support, cover, cross support, E-model WM06	2	A71917-0	3.91
5	111550	Washer ZN M10 DIN125	156		
6	102210	Hexagon bolt ZN M10x25 DIN933	78		0.02
7	110560	Hexagon nut M10 DIN934	78		0.01

Rain cover for elevator (33332), spare parts



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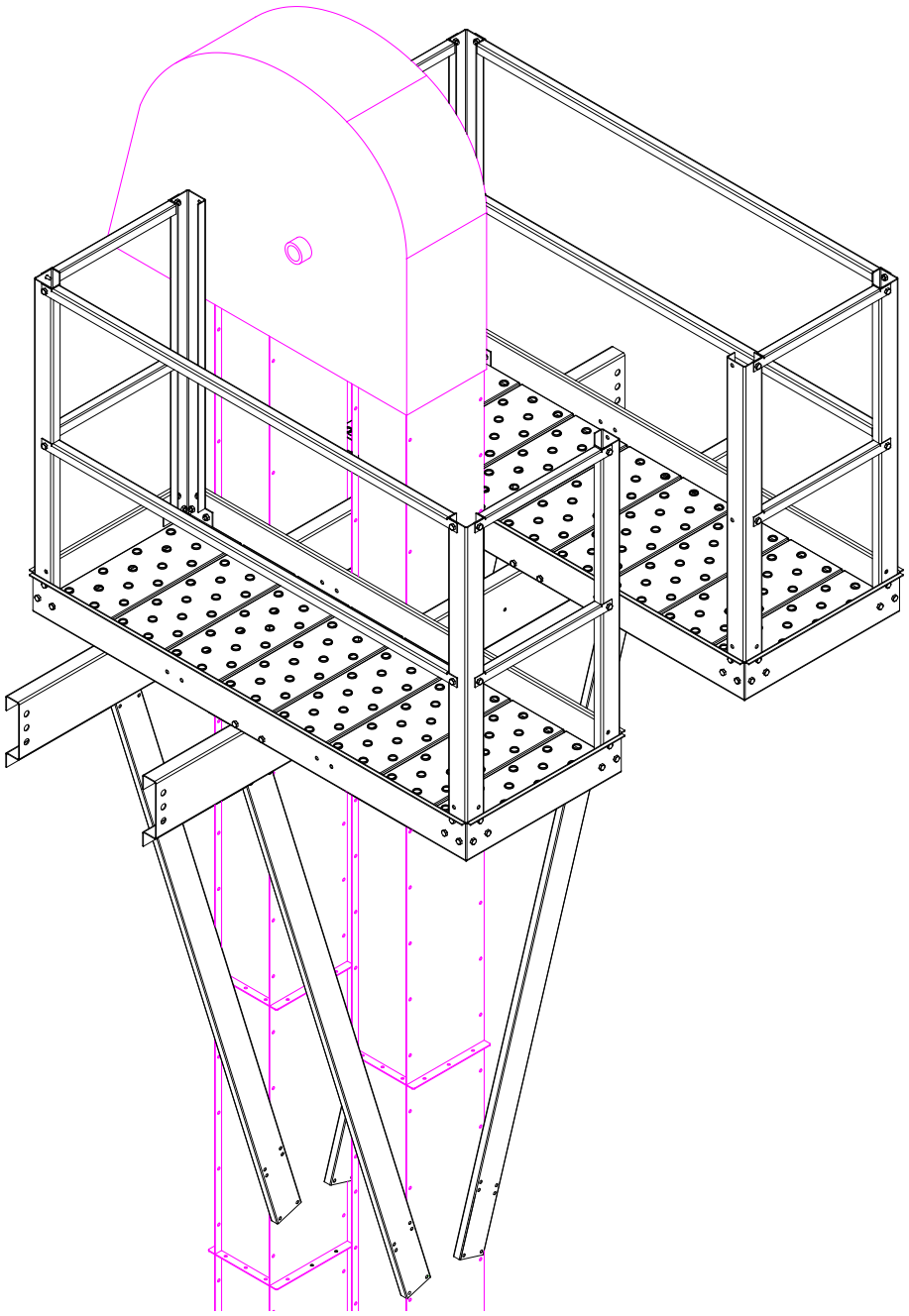
Ref.	Part no.	Denomination	Pcs	Dwg. No.	Weight
1	32964	Rain cover for E-model elevator, Nord 3282 5282	1	32964-A	12.43
2	32963	Rain cover bracket for E-model elevator, Nord 3282 ... 5282	1	32963-B	1.78
3	111303	Wing nut ZN M8x25 AM DIN316	4		0.03
4	102499	Hexagon bolt ZN M12x20 DIN933, Nord 5282	2		0.03
5	102200	Hexagon bolt ZN M10x20 DIN933, Nord 3282 and 4282	2		0.02

INSTALLING ADDITIONAL EQUIPMENT OF THE ELEVATOR

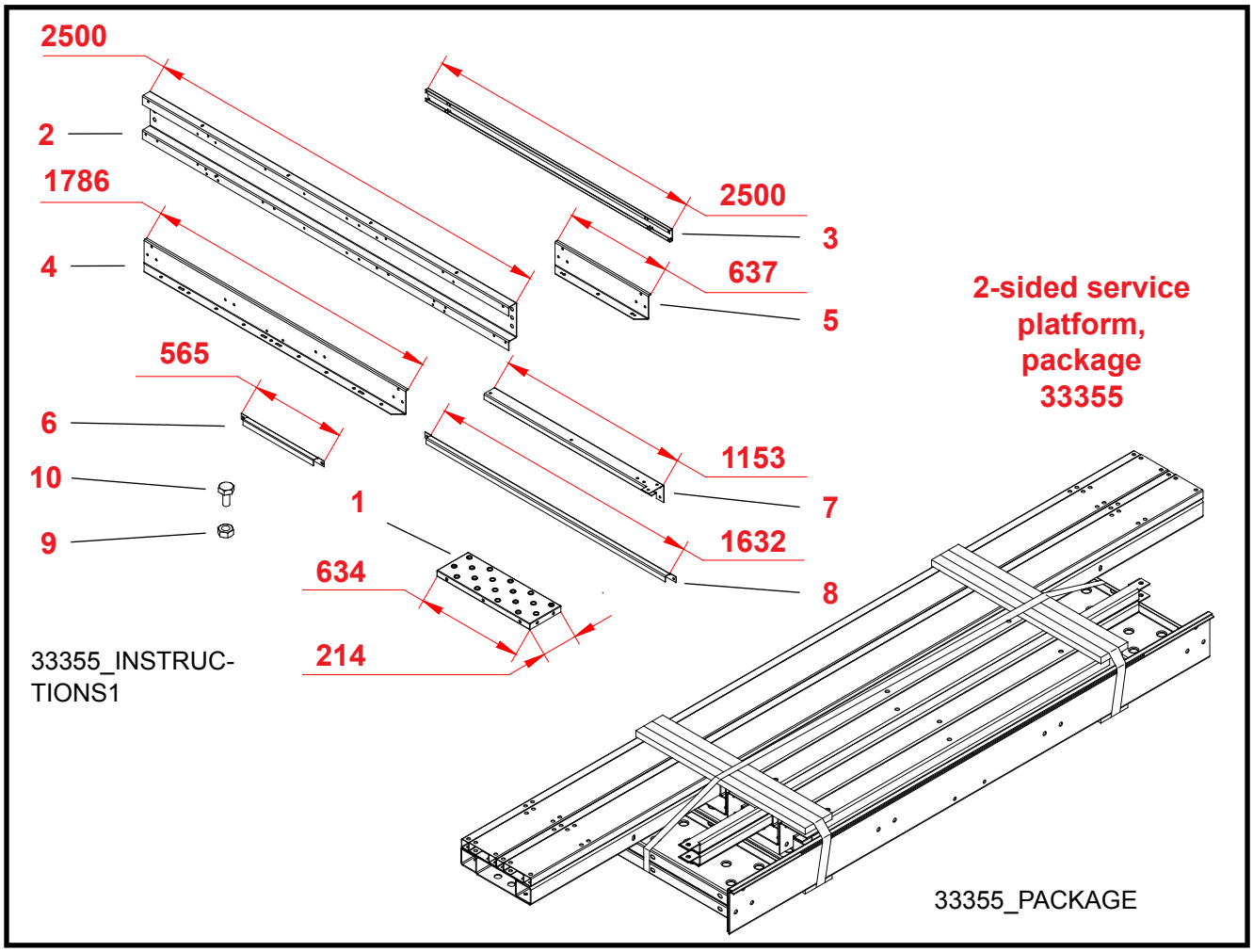
2-sided service platform (33355)

Service platform installed on the top of the elevator on the dryer with one elevator.



Structure of the 2-sided service platform (33355)

Parts of a 2-sided service platfor(for a dryer with one elevatpr), package 33355



20080101

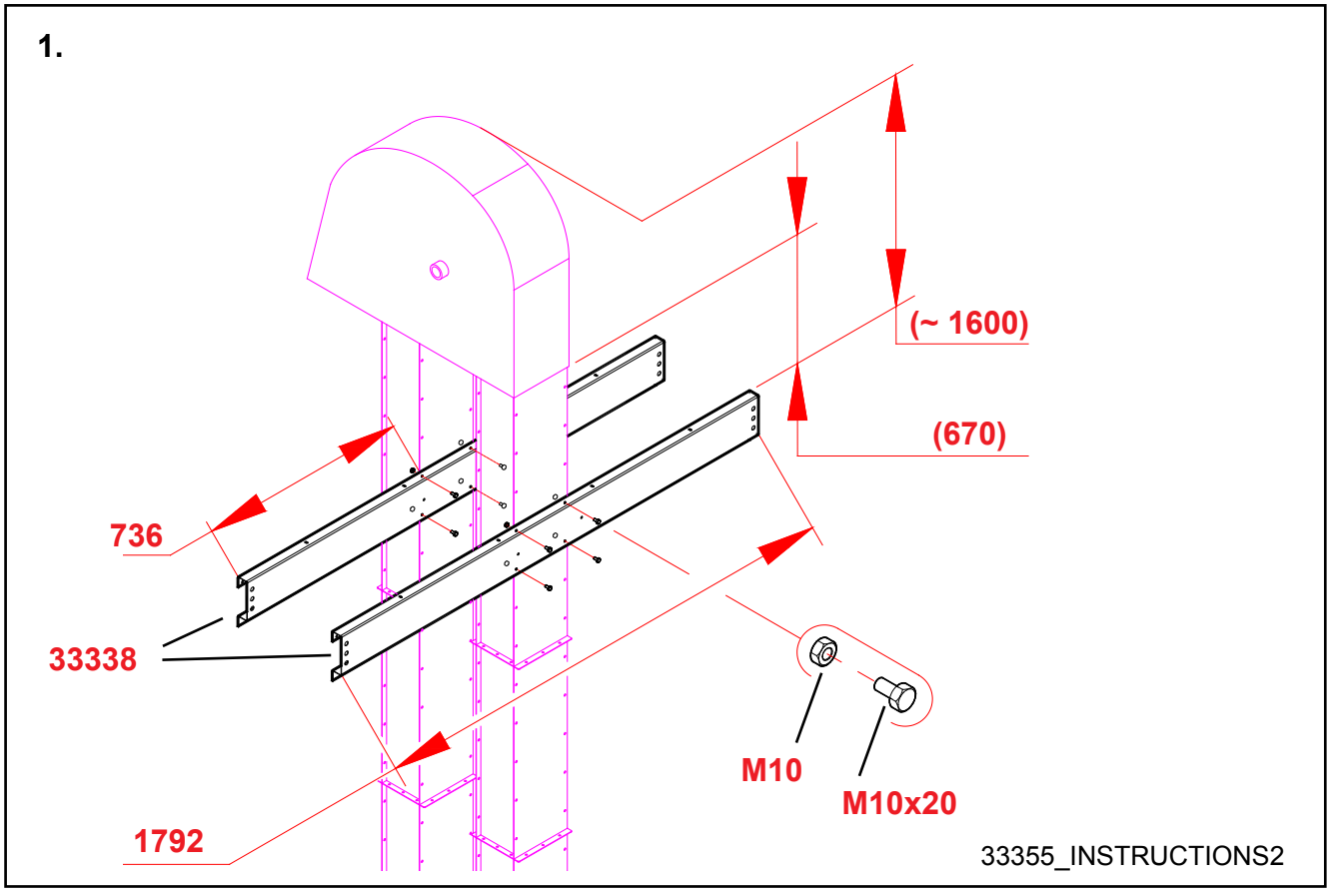
Ref.	Part no.	Denomination	Pcs	Dwg. No.	Weight
1	A71545	Platform element for elevator 215 x 635 x 35	16	A71545-A	2.35
2	33338	Mega cladding, frame beam, service platform for elevator	2	33338-B	20.34
3	33339	Mega cladding, cross-brace, service platform for elevator	4	33339-0	5.93
4	33340	Mega cladding, kicking plate 1786, service platform for elevator	4	33340-B	8.34
5	33341	Mega cladding, kicking plate 637, service platform for elevator	4	33341-0	2.94
6	33343	Mega cladding, handrail 565, service platform for elevator	8	33343-A	0.72
7	32587	Mega cladding, corner post, handrail, upper level	8	32587-A	5.48
8	32583	Mega cladding, handrail 1632, service platform for elevator	4	32583-0	3.60
9	110560	Hexagon nut M10 DIN934	134		0.01
10	102200	Hexagon bolt ZN M10x20 DIN933	122		0.02
11	315450	Board, L = 630 22x100	4		1.01

Installing 2-sided service platform (33355)

2-SIDED SERVICE PLATFORM, DRYER WITH ONE ELEVATOR

The top of the elevator can be about 7 metres above the top cover of the dryer and, therefore it can sway slightly during installation. Because the gear motor of the elevator is heavy, it is advisable to install it last, when the platforms and supports are already in place.

It is possible to assemble the platform on the ground and lift it into place ready-assembled. Next instructions deal with assembly and installation works up in the elevator.

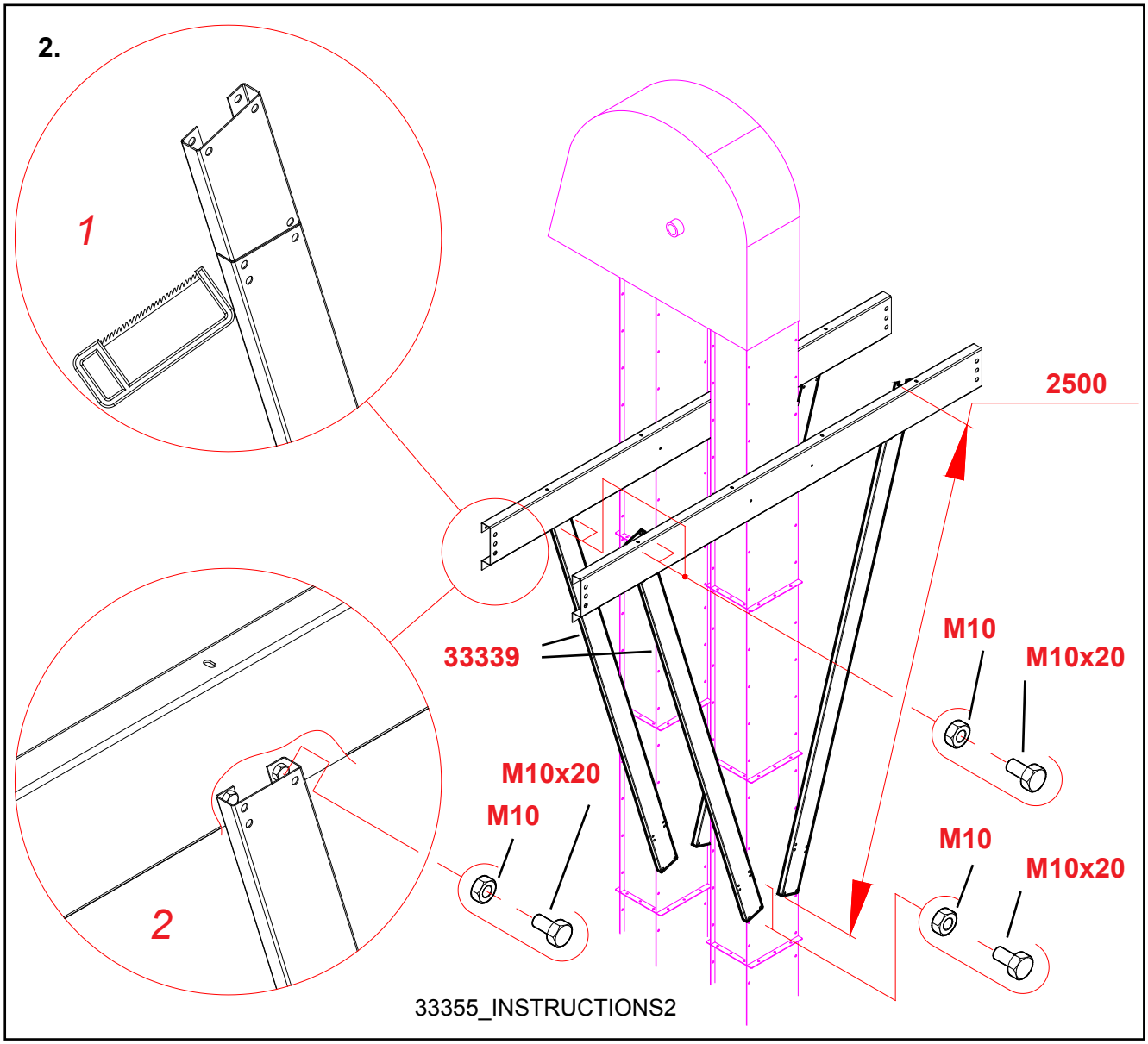


Stage 1. Installing the frame beams

The service platform shall be installed at a distance of about 1,6 m below the top of the elevator.

1. Start the work by installing the frame beams (33338).

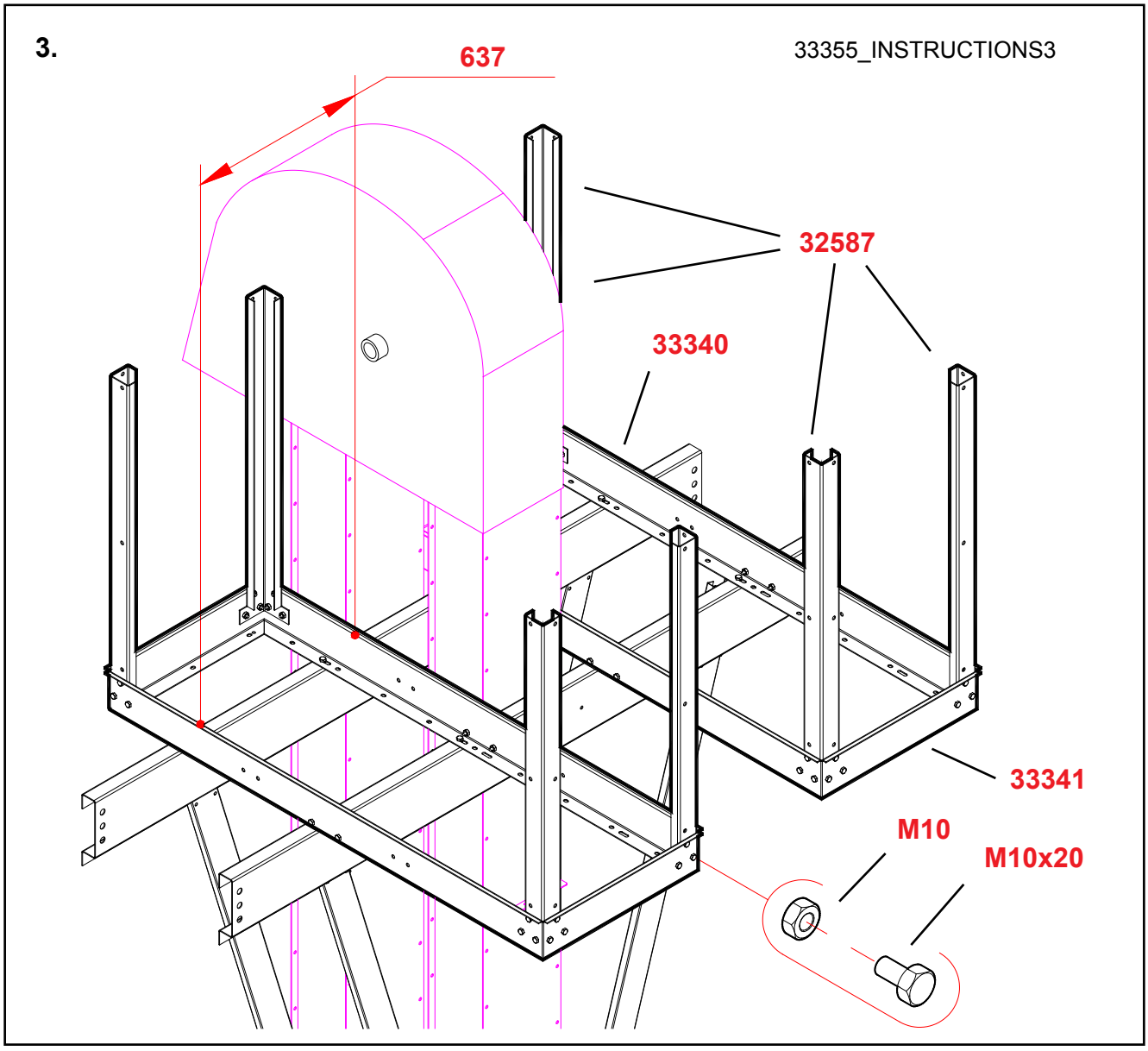
Place the service platforms onto the beams.



Stage 2. Installing the cross-braces

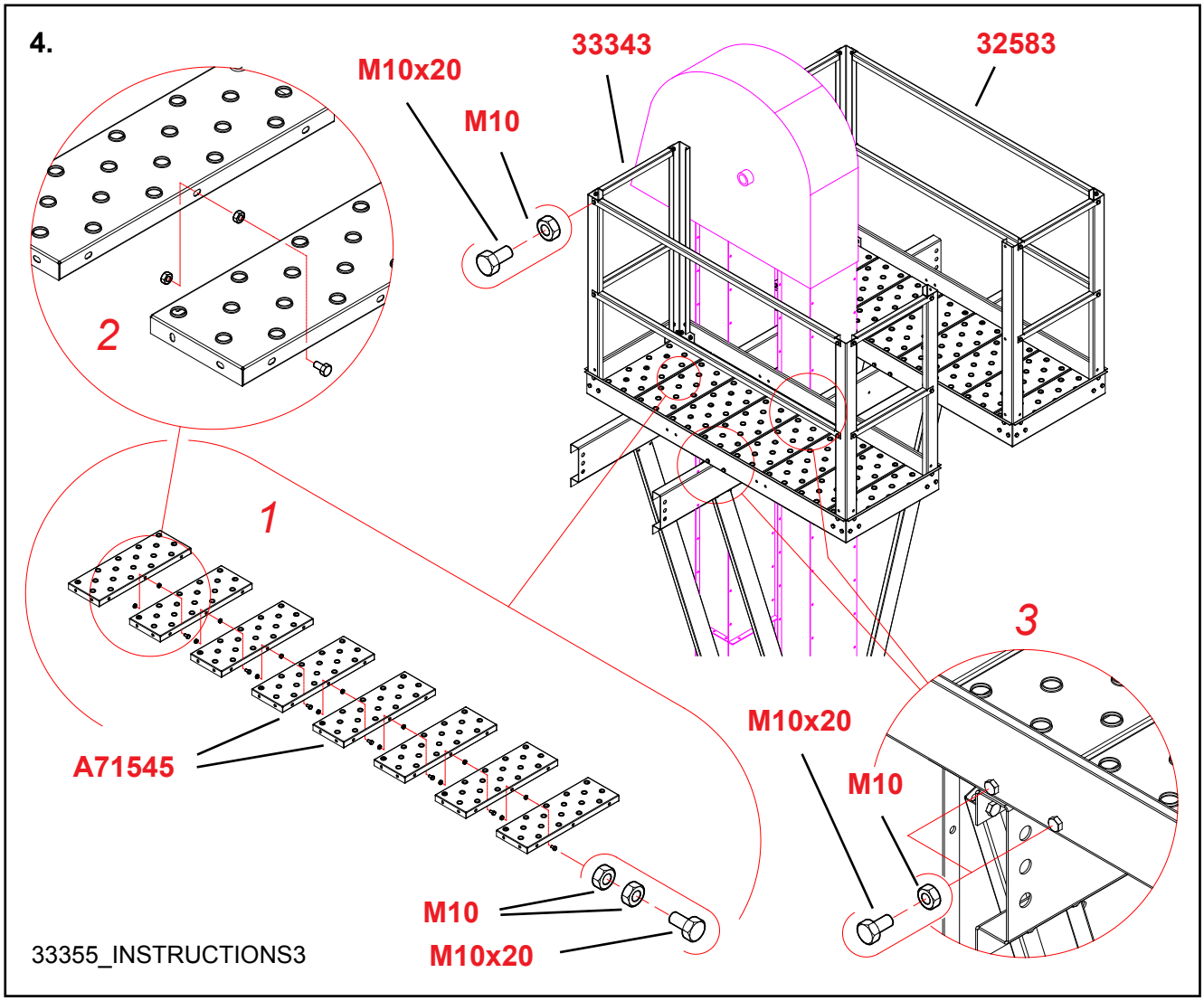
1. Install the cross-braces (33339) after the frame beams.

The braces farther away from the dryer are installed as they stand.
The braces closer to the dryer are shortened by their upper ends to enable installing them under the frame beam.
See detail drawings 1 and 2.



Stage 3. Installing the lengthwise beams, the corner posts and the end beams.

1. **Install the lengthwise beams (33340) of the platform on the frame beams.**
2. **Attach the corner posts (32587) and the end beams (33341) to the lengthwise beams.**
3. **Fit the distance between the lengthwise beams to 637 mm and tighten the bolts.**



Stage 4. Installing the platform elements and the handrails

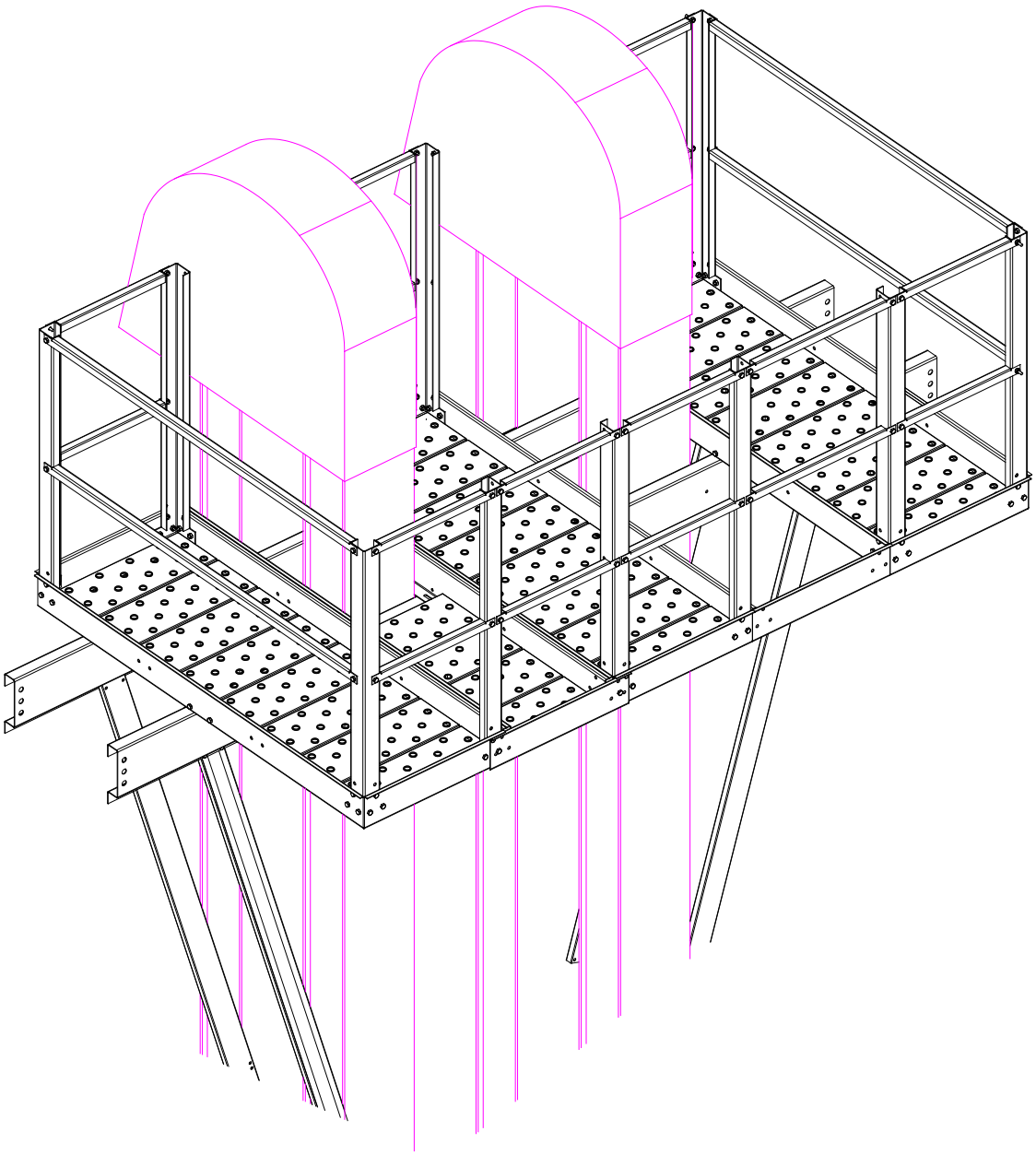
1. **Join the platform elements (A71545) first together.**
   Put an M10x20 bolt and two M10 nuts in the midmost holes in the long edges of the elements so that one of the M10 nuts comes between the elements. See detail drawings 1 and 2.

2. **Fix the ready-assembled platforms by the ends of the midmost platform elements in the holes in the centre of the lengthwise beam.**
   See detail drawing 3.

3. **Fix the handrails (32583 and 33343) in place using bolts.**

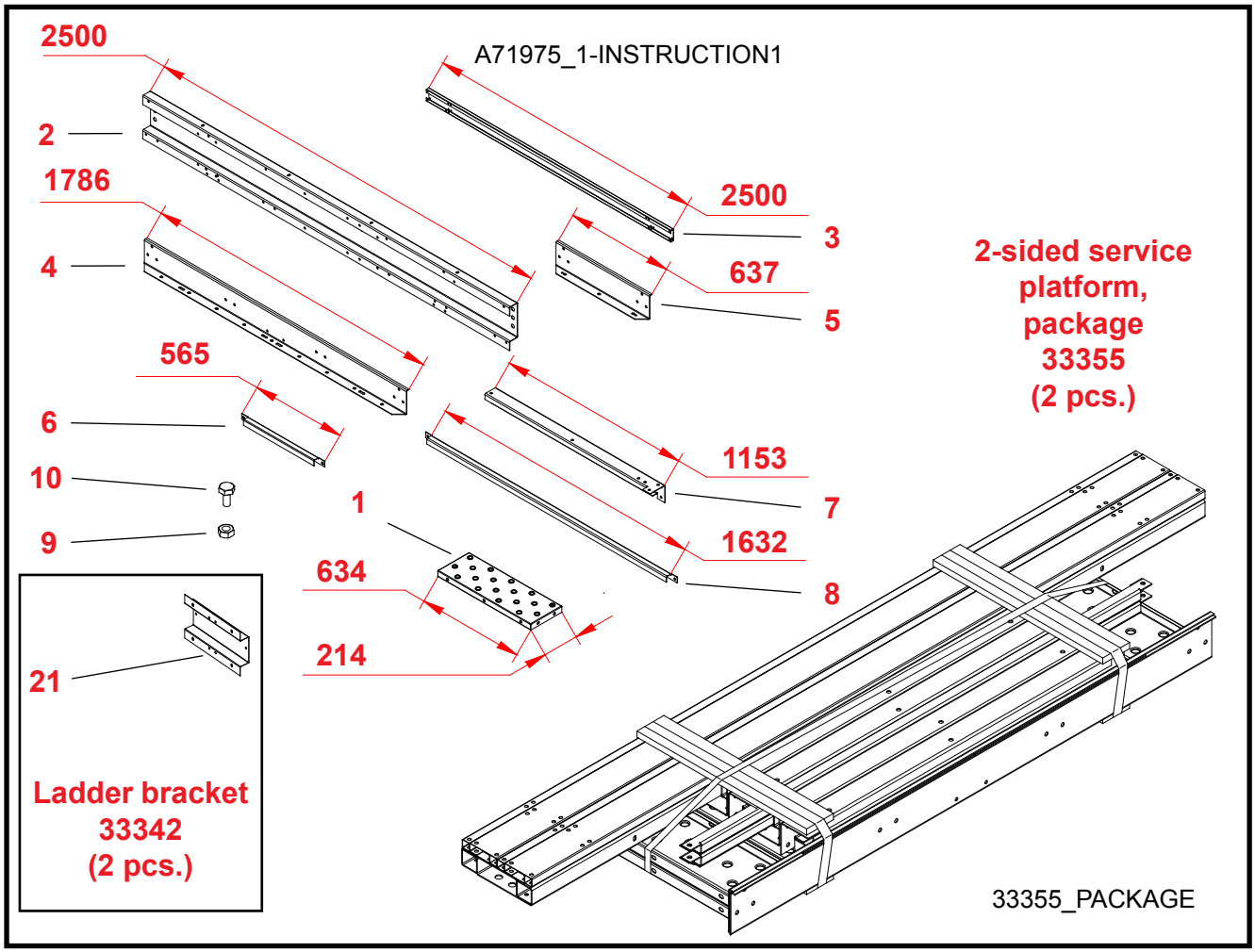
3-part service platform (A71975)

Service platform installed at the top part of the elevators on a dryer with two elevators.



Structure of 3-part service platform (A71975)

Parts of the 3-part service platform (dryer with two elevators), two packages 33355 and in addition two pieces of ladder brackets 33342



20080101

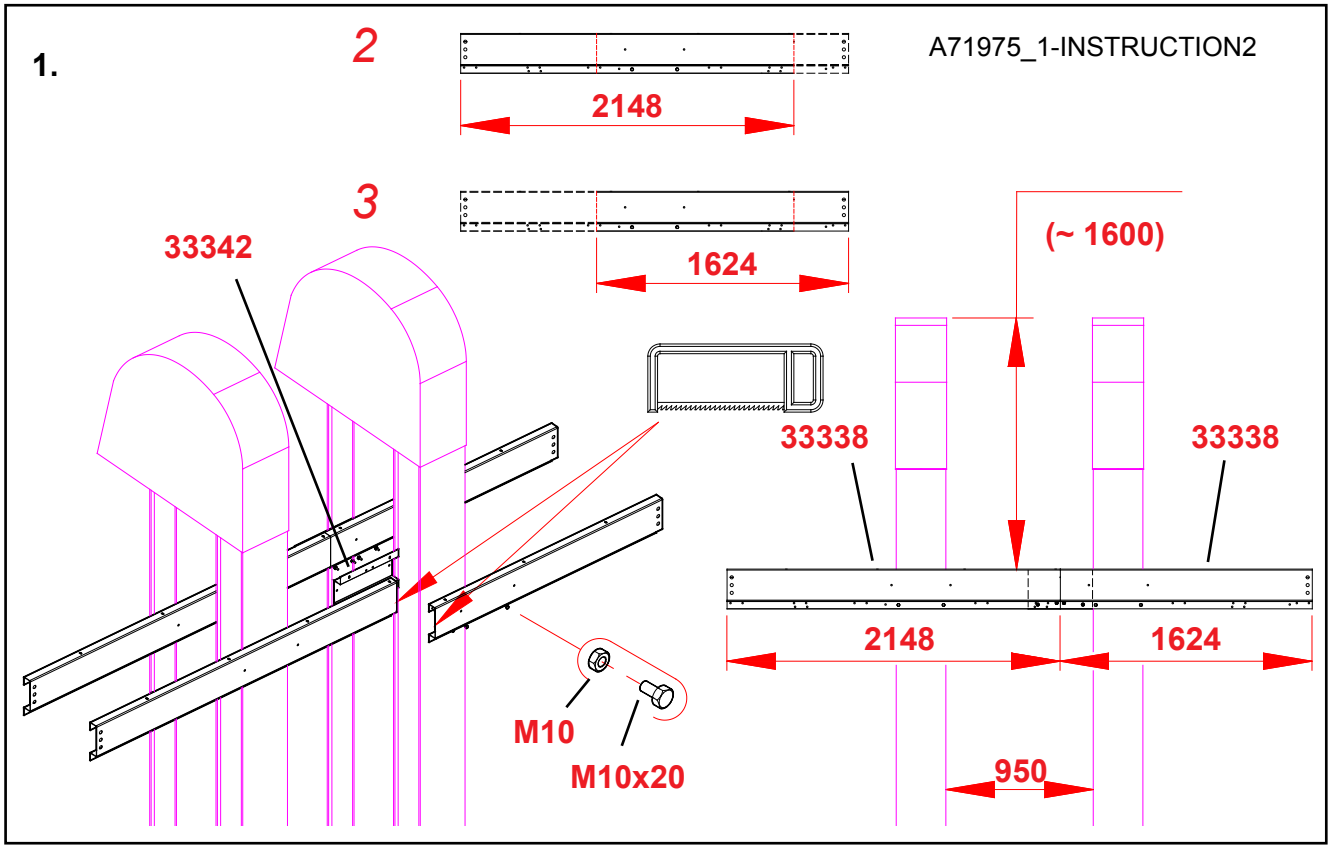
Ref.	Part no.	Denomination	Pcs	Dwg. No.	Weight
1	A71545	Platform element for elevator 215 x 635 x 3	516	A71545-A	2.35
2	33338	Mega cladding, frame beam, service platform for elevator	2	33338-B	20.34
3	33339	Mega cladding, cross-brace, service platform for elevator	4	33339-0	5.93
4	33340	Mega cladding, kicking plate 1786, service platform for elevator	4	33340-B	8.34
5	33341	Mega cladding, kicking plate 637, service platform for elevator	4	33341-0	2.94
6	33343	Mega cladding, handrail 565, service platform for elevator	8	33343-A	0.72
7	32587	Mega cladding, corner post, handrail, upper level	8	32587-A	5.48
8	32583	Mega cladding, handrail 1632, service platform for elevator	4	32583-0	3.60
9	110560	Hexagon nut M10 DIN934	134		0.01
10	102200	Hexagon bolt ZN M10x20 DIN933	122		0.02
11	315450	Board, L = 630 22x100	4		1.01
21	33342	Ladder bracket	2		

Installing the 3-part service platform (A71975)

3-PART SERVICE PLATFORM, DRYER WITH TWO ELEVATORS

The top of the elevators can be about 7 metres above the top cover of the dryer and, therefore, the elevators sway slightly during installation. Because the gear motors of the elevators are heavy, it is advisable to install them last, when the platforms and supports are already in place.

It is possible to assemble the platforms on the ground and lift them into place ready-assembled. Next instructions deal with assembly and installation works up in the elevator.



Stage 1. Installing the frame beams

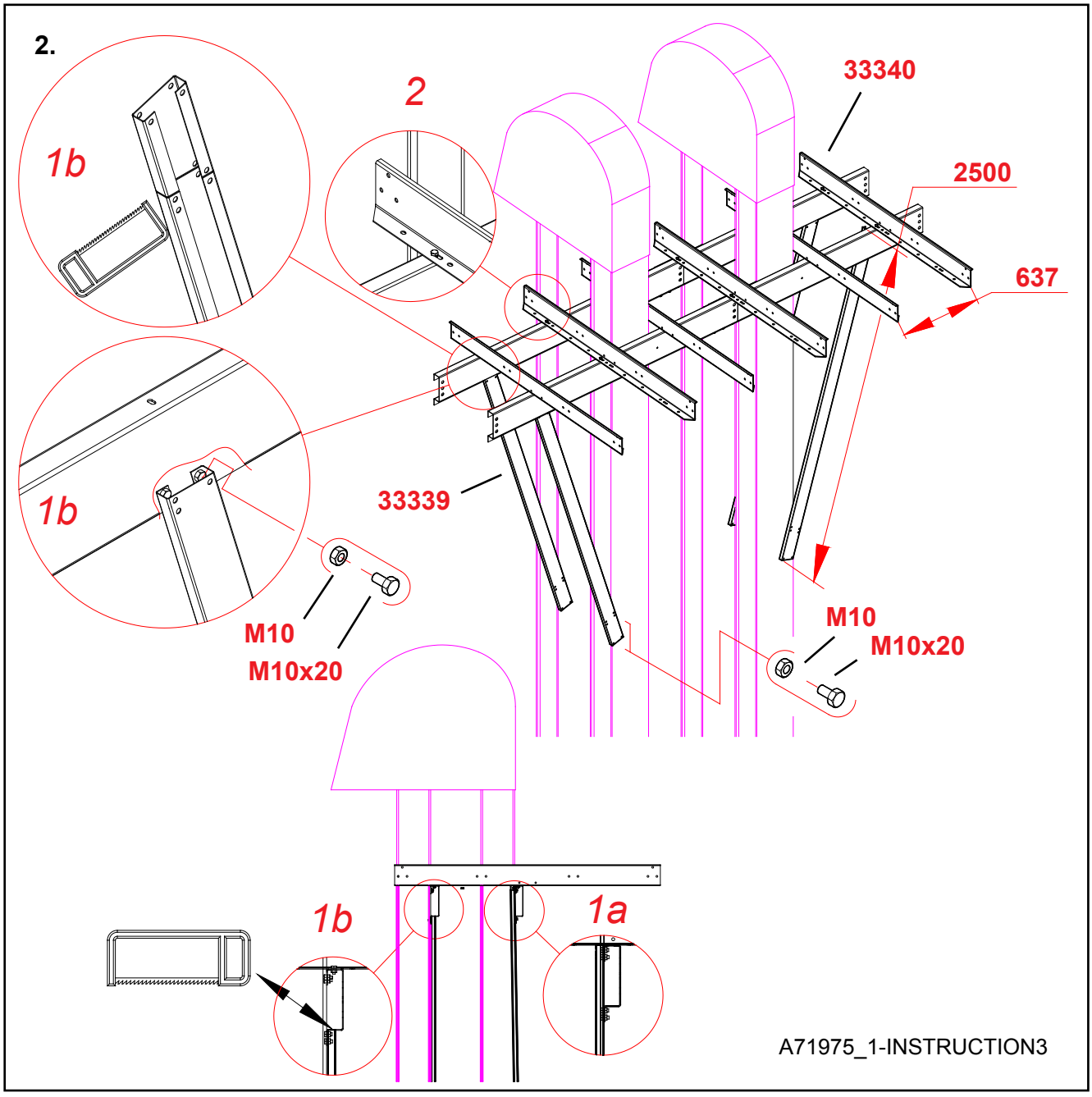
The service platform shall be installed at a distance of about 1,6 m below the top of the elevators.

1. **Start the work by installing the frame beams (33338).**
   Place the service platforms onto the beams.

2. **Cut the right-hand side ends (in the drawing) of two of the frame beams to a length of 2148 mm.**

3. **Cut the left-hand side ends (in the drawing) of two of the frame beams to a length of 1624 mm.**
   The cutting points are marked in the beams by punching.
   These dimensions are valid provided that the distance between the elevators is 950 mm.

4. **Join the 2148 mm and 1624 mm long, cut-off frame beams together using ladder bracket (33342).**
   The holes are ready in the beams. Use M10x20 bolts and M10 nuts.

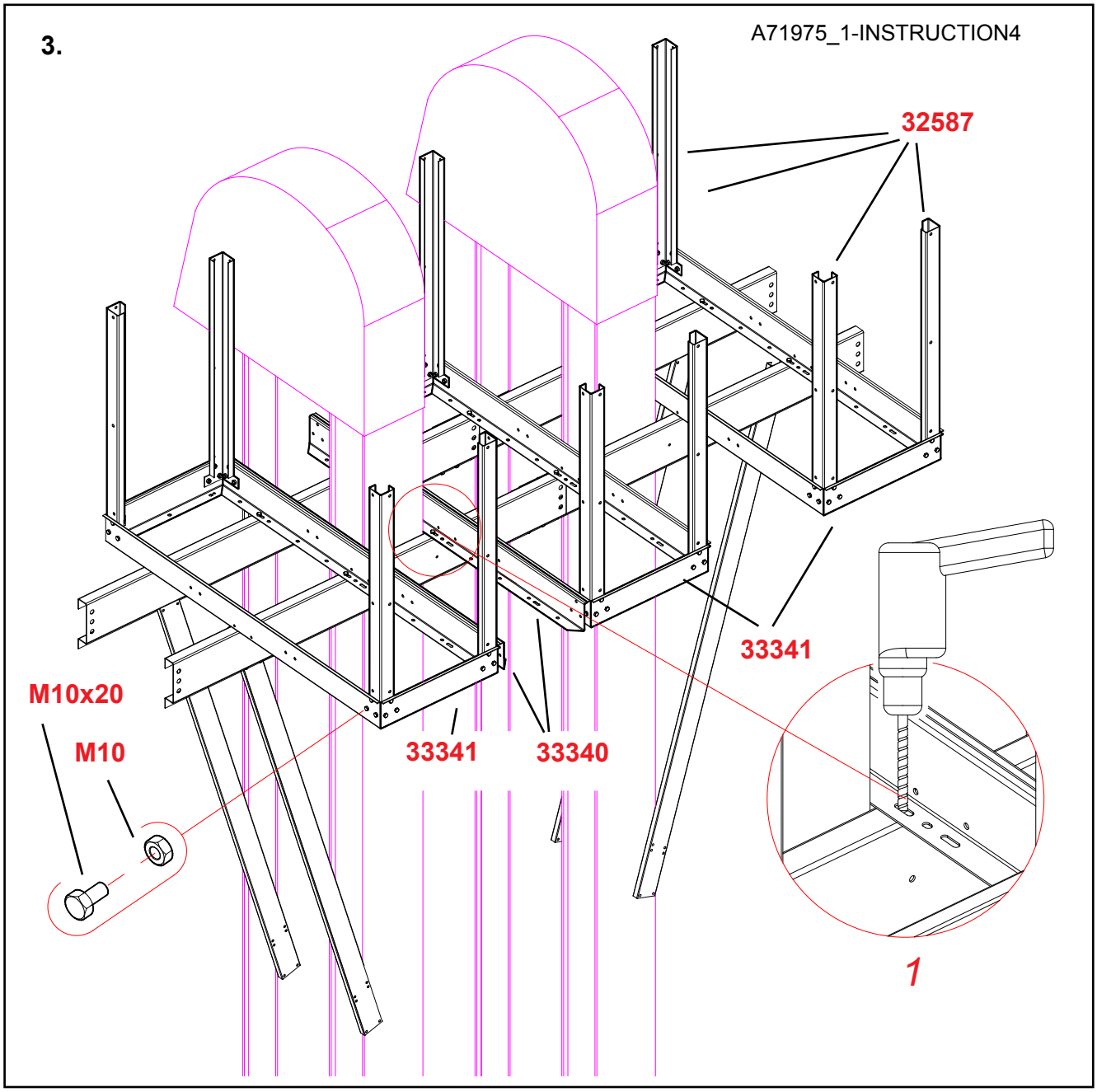


Stage 2. Installing the cross-braces and the lengthwise beams (6 pcs.) of the platform

1. **Install the cross-braces (33339) after the frame beams.**
a. The brace farther away from the dryer is installed as it stands.
b. The brace closer to the dryer is shortened by its upper end to enable installing it under the frame beam. Cutting and attachment of the cut-off brace, see detail drawings 1b.

2. **Install the lengthwise beams of the platform (6 pcs. of 33340) on the frame beams.** See detail drawing 2.

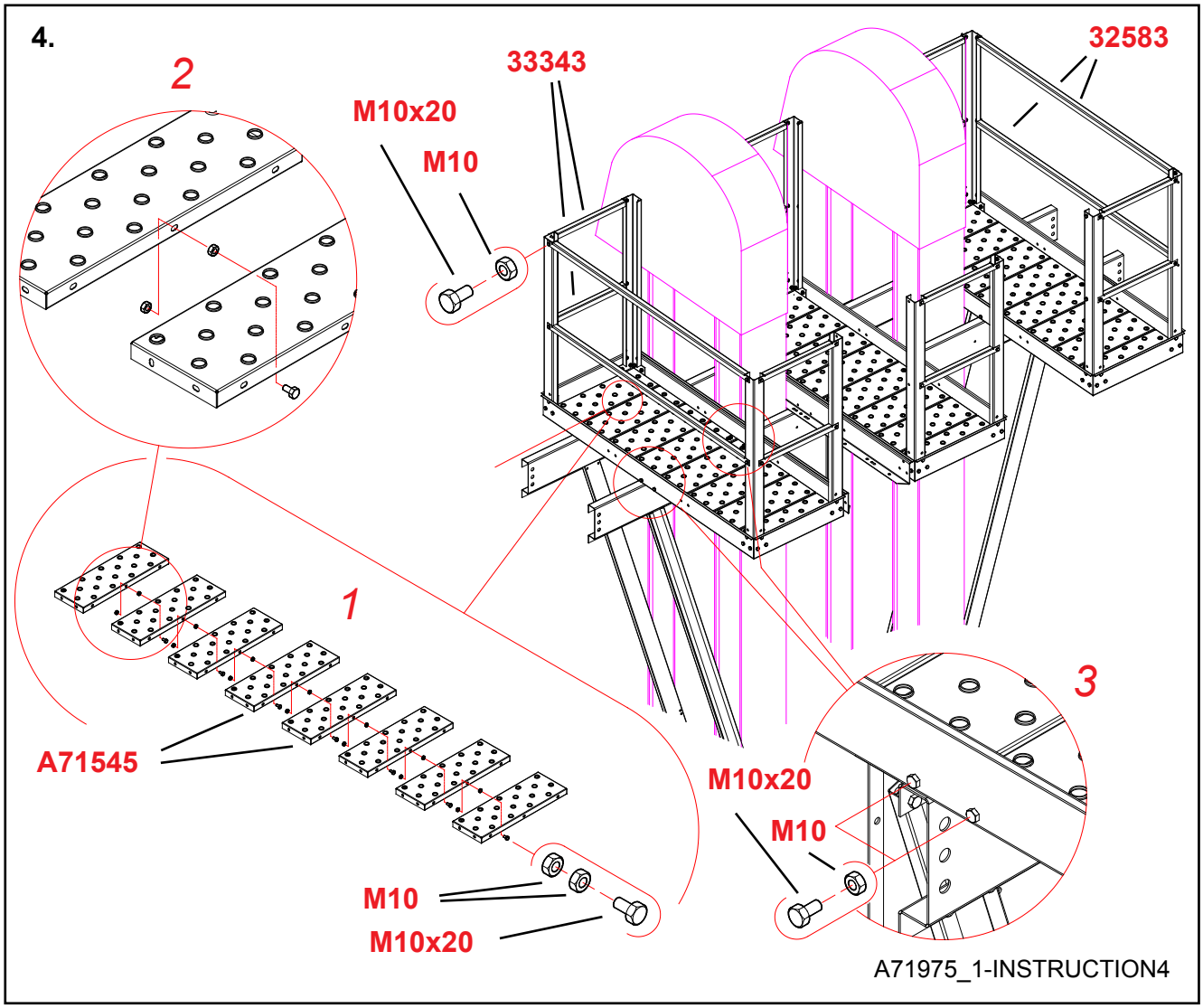
3. **Fit the distance between the lengthwise beams to 637 mm and tighten the bolts.**



Stage 3.
Installing the lengthwise beams, the corner posts and the end beams of the platform at the elevator.

1. **Install the two lengthwise beams (33340) of the platform to be installed at the elevator, see drawing.**
   Position the beams close to the beams installed at the stage 2.
   Drill the required holes in the flanges of the frame beams (see detail drawing 1).

2. **Attach the corner posts (32587) and the end beams (33341).**

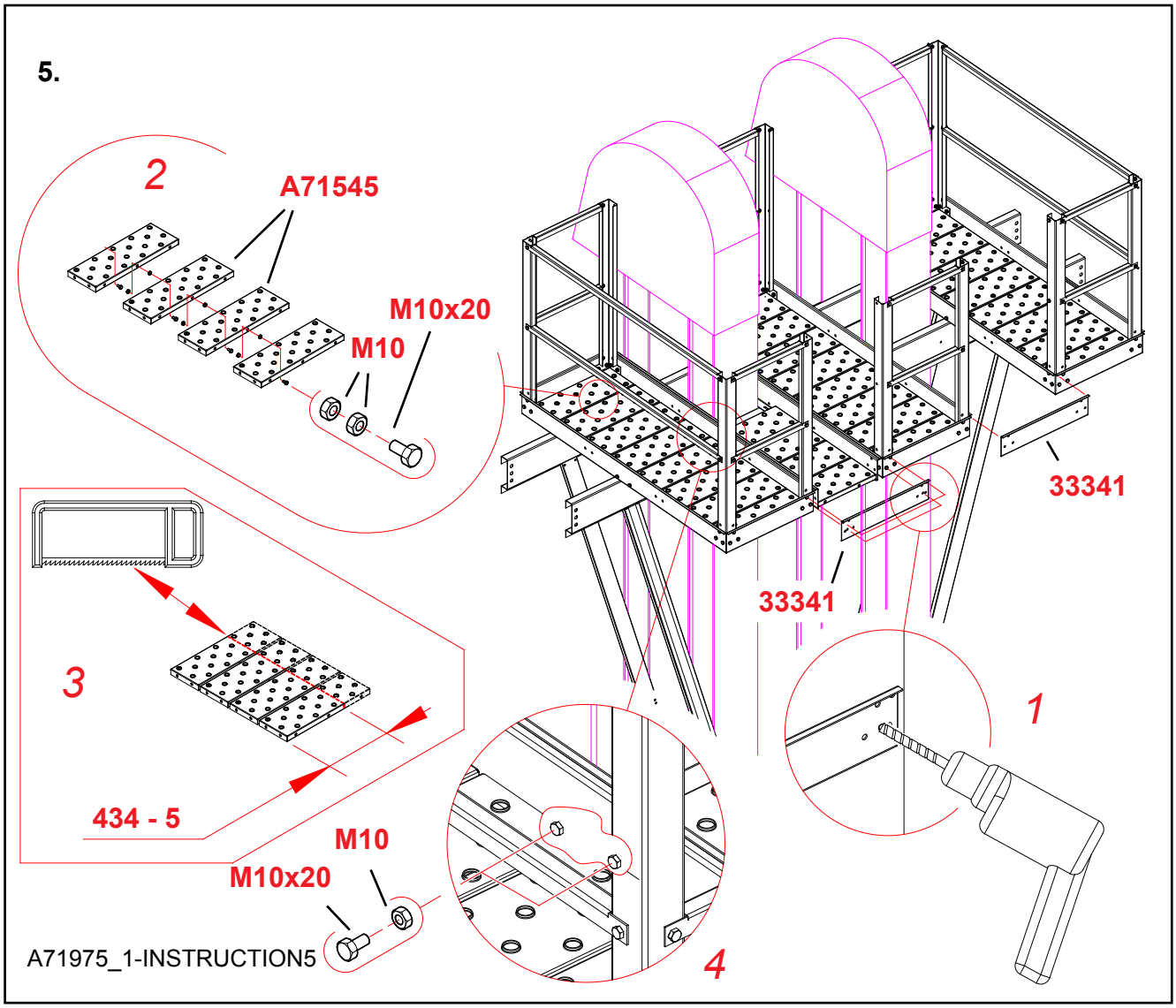


Stage 4. Installing the platform elements and the handrails

1. **Join the platform elements (A71545) first together.**
   Put an M10x20 bolt and two M10 nuts in the midmost holes in the long edges of the elements so that one of the M10 nuts comes between the elements. See detail drawings 1 and 2.

2. **Fix the ready-assembled platforms by the ends of the midmost platform elements in the holes in the centre of the lengthwise beam.**
   See detail drawing 3.

3. **Fix the handrails (32583 and 33343) in place using bolts.**



Stage 5. Installing the end beams and the platform element (the platform at the elevator)

Use the short end beams (33341) as end beams in the openings at the elevators.

1. **Drill the additional holes in the beam at the narrower opening (detail drawing 1).**

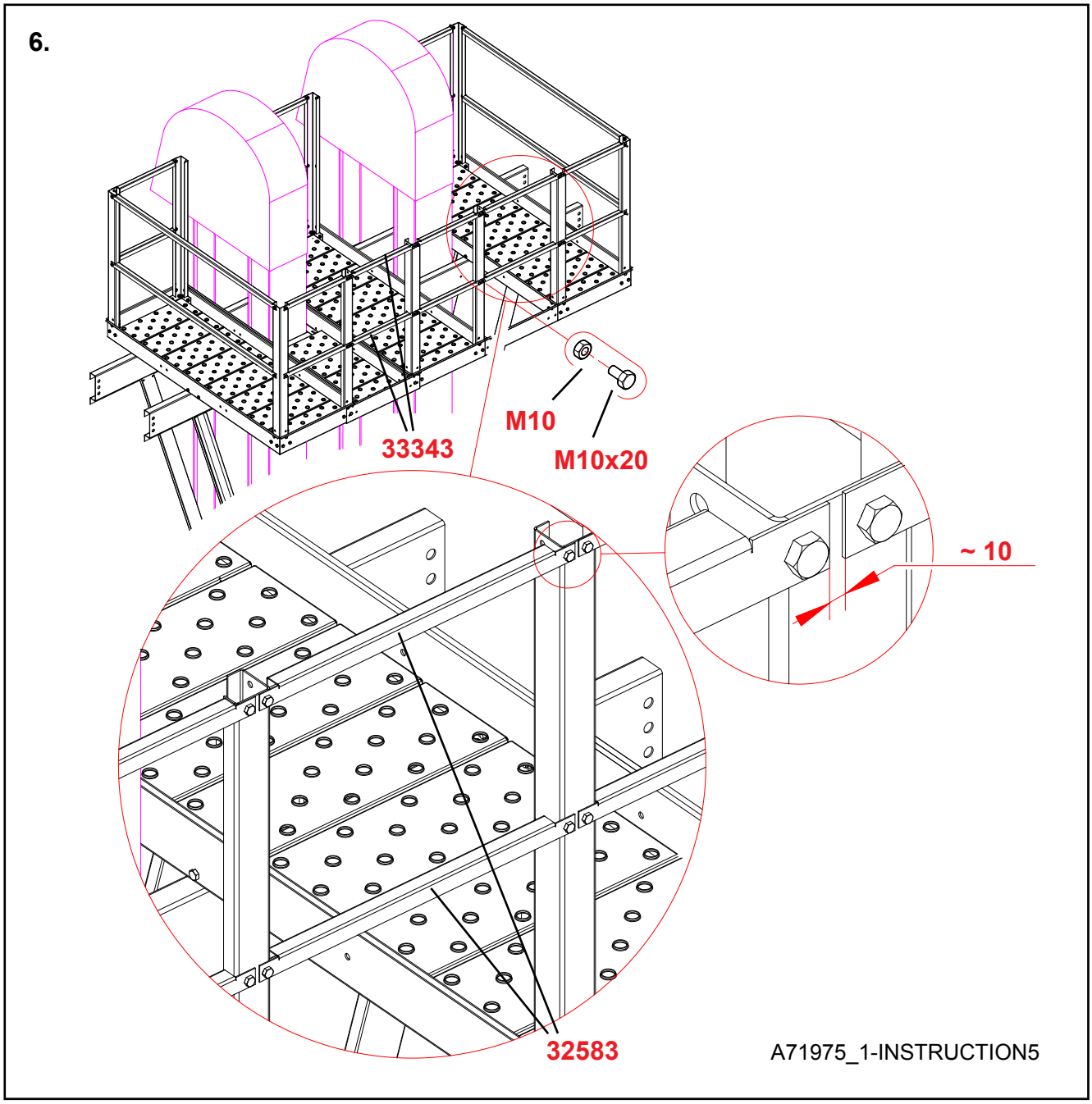
2. **Fix the beam on top of the end beams, installed during stage 3, using the same bolts.**

3. **Attach by welding the beam at the wider opening and protect the seams using zinc spray.**

4. **Join the four platform elements (A71545) first together.**
   Put an M10x20 bolt and two M10 nuts in the midmost holes in the long edges of the elements so that one of the M10 nuts comes between the elements. See detail drawings 1 and 2.

5. **Cut the platform elements to be installed at the elevator to a length of 434 (- 5) mm (detail drawing 3).**

6. **Attach the ready-assembled platform to the lengthwise beams (33340) by one of its edges. See detail dwg. 4.**



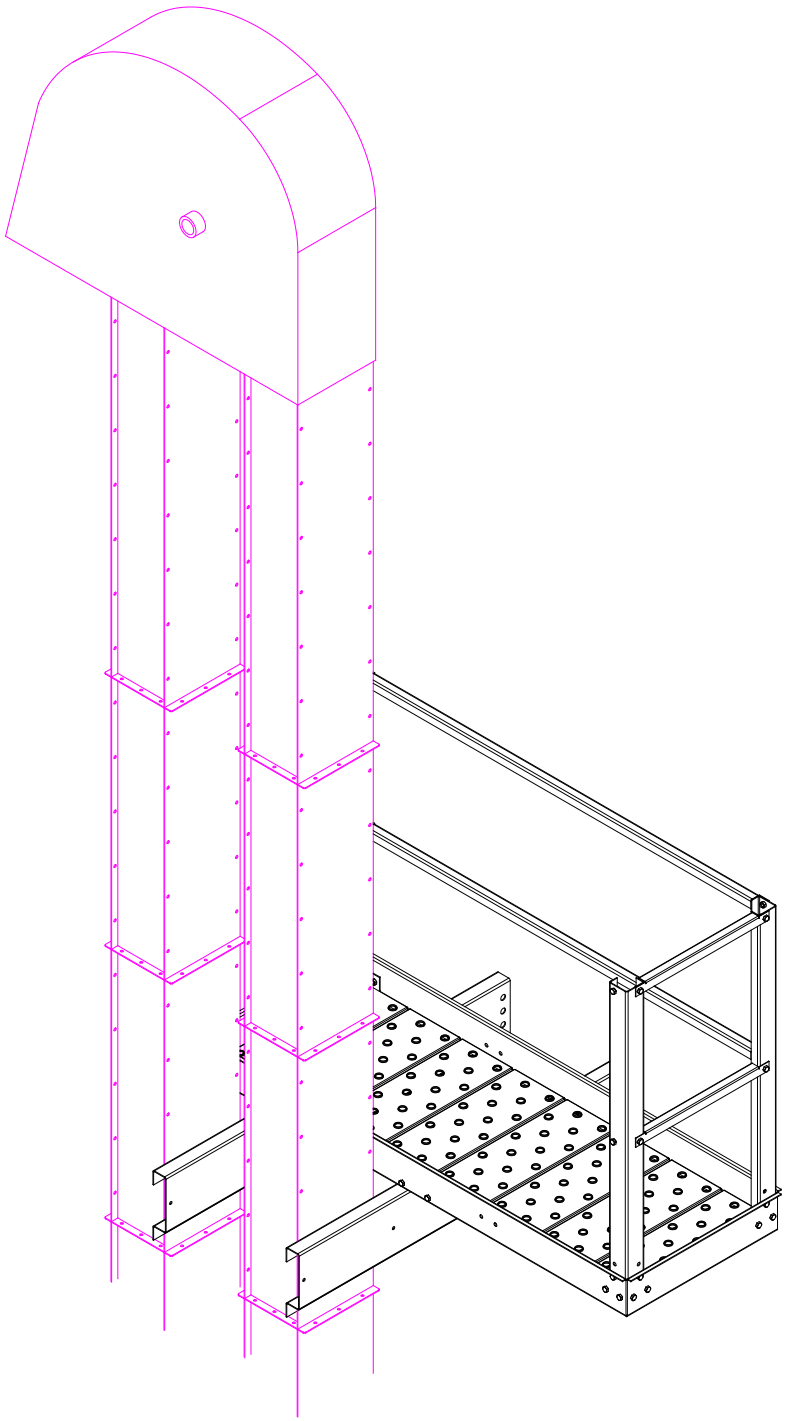
6. Installing the handrails at the elevators

1. **Install the handrails (33343) at the elevator, on the left-hand side in the drawing.**

2. **Use at the wider opening longer handrails (32583) by cutting them to a suitable length.**
   Form the ends of the handrail profiles so that they fit in the corner posts (see detail drawings).

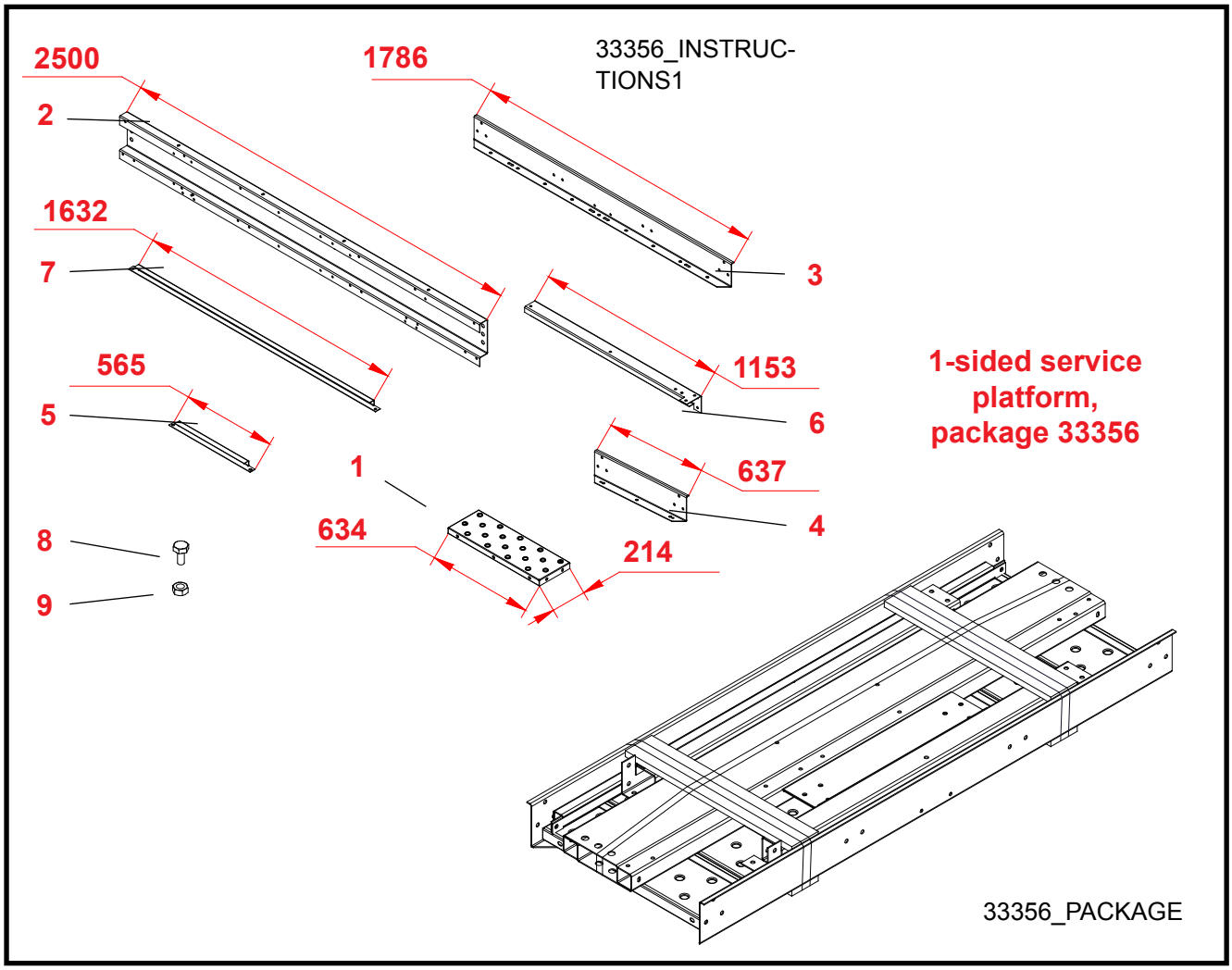
1-sided service platform (33356)

The service platform installed at the side of the elevator (level with the top cover of the dryer).



Structure of the 1-sided service platform (33356)

Parts of the 1-sided service platform (dryer with one or two elevators)



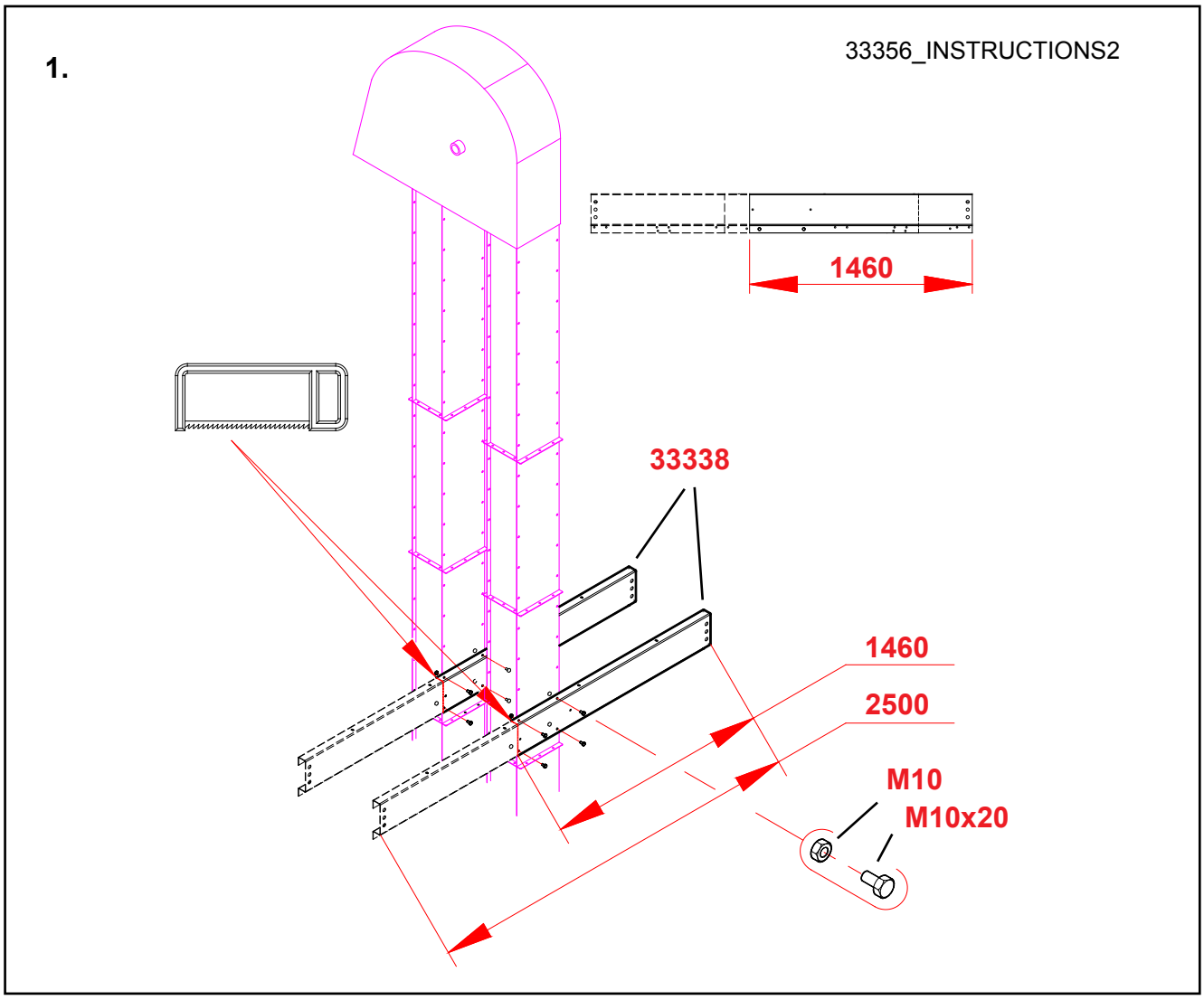
20080101

Ref.	Part no.	Denomination	Pcs	Dwg. No.	Weight
1	A71545	Platform element for elevator 215 x 635 x 35	8	A71545-A	2.35
2	33338	Mega cladding, frame beam, service platform for elevator	2	33338-B	20.34
3	33340	Mega cladding, kicking plate 1786, service platform for elevator	2	33340-B	8.34
4	33341	Mega cladding, kicking plate 637, service platform for elevator	2	33341-0	2.94
5	33343	Mega cladding, handrail 565, service platform for elevator	4	33343-A	0.72
6	32587	Mega cladding, corner post, handrail, upper leve	l4	32587-A	5.48
7	32583	Mega cladding, handrail 1632, service platform for elevator	4	32583-0	3.60
8	102200	Hexagon bolt ZN M10x20 DIN933	61		0.02
9	110560	Hexagon nut M10 DIN934	68		0.01
10	315450	Board, L = 630 22x100	4		1.01

Installing 1-sided service platform (33356)

1-SIDED SERVICE PLATFORM, DRYER WITH ONE OR TWO ELEVATORS

It is possible to assemble the platform on the ground and lift it into place ready-assembled. Next instructions deal with assembly and installation works up in the elevator.

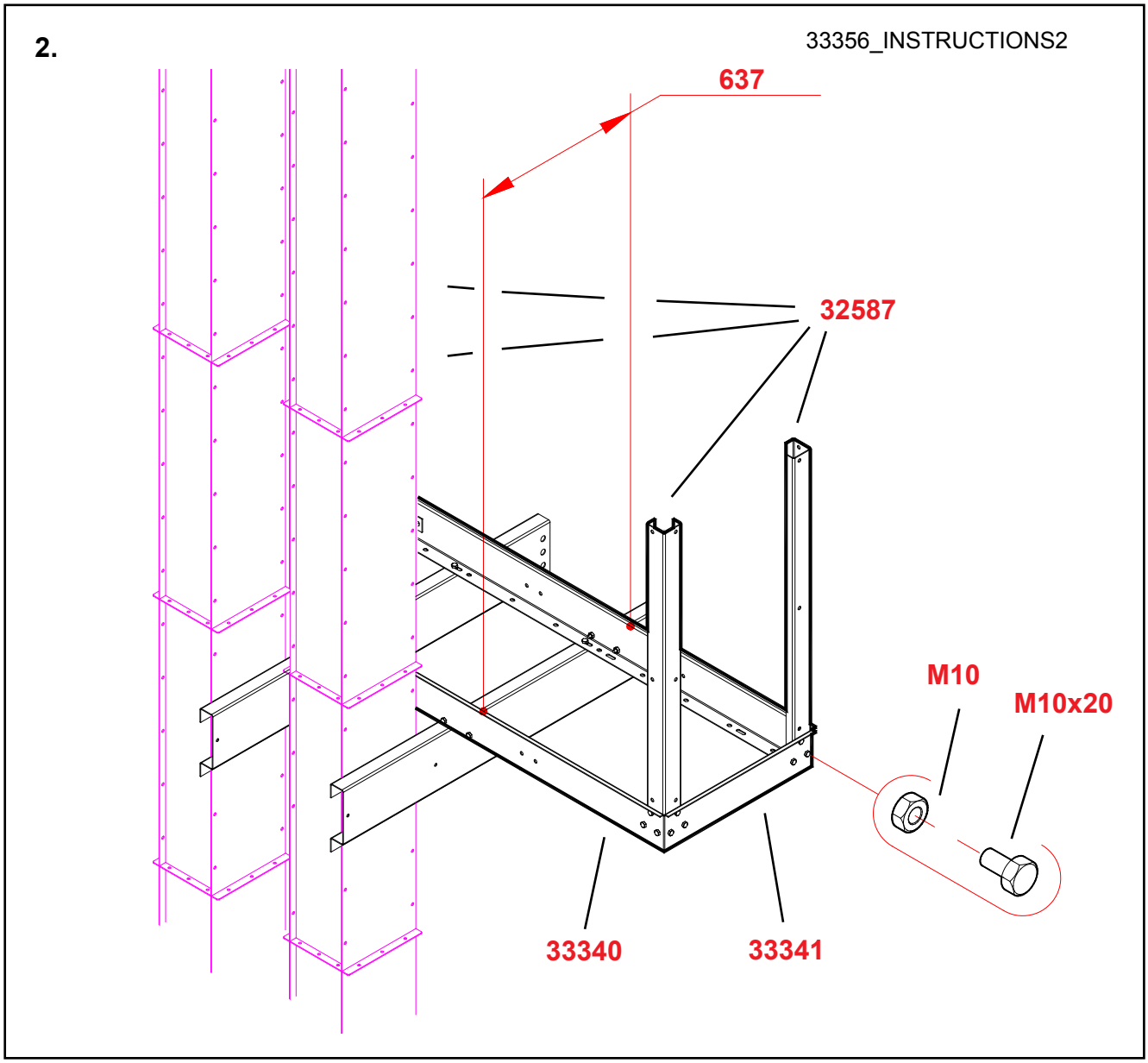


Stage 1. Installing the frame beams

The 1-sided service platform is attached level with the top cover of the dryer.

1. **Because there is only one service platform, a part of the frame beams (33338) can be cut off.**
   The length of the beam after the cutting is 1460 mm (see drawing).

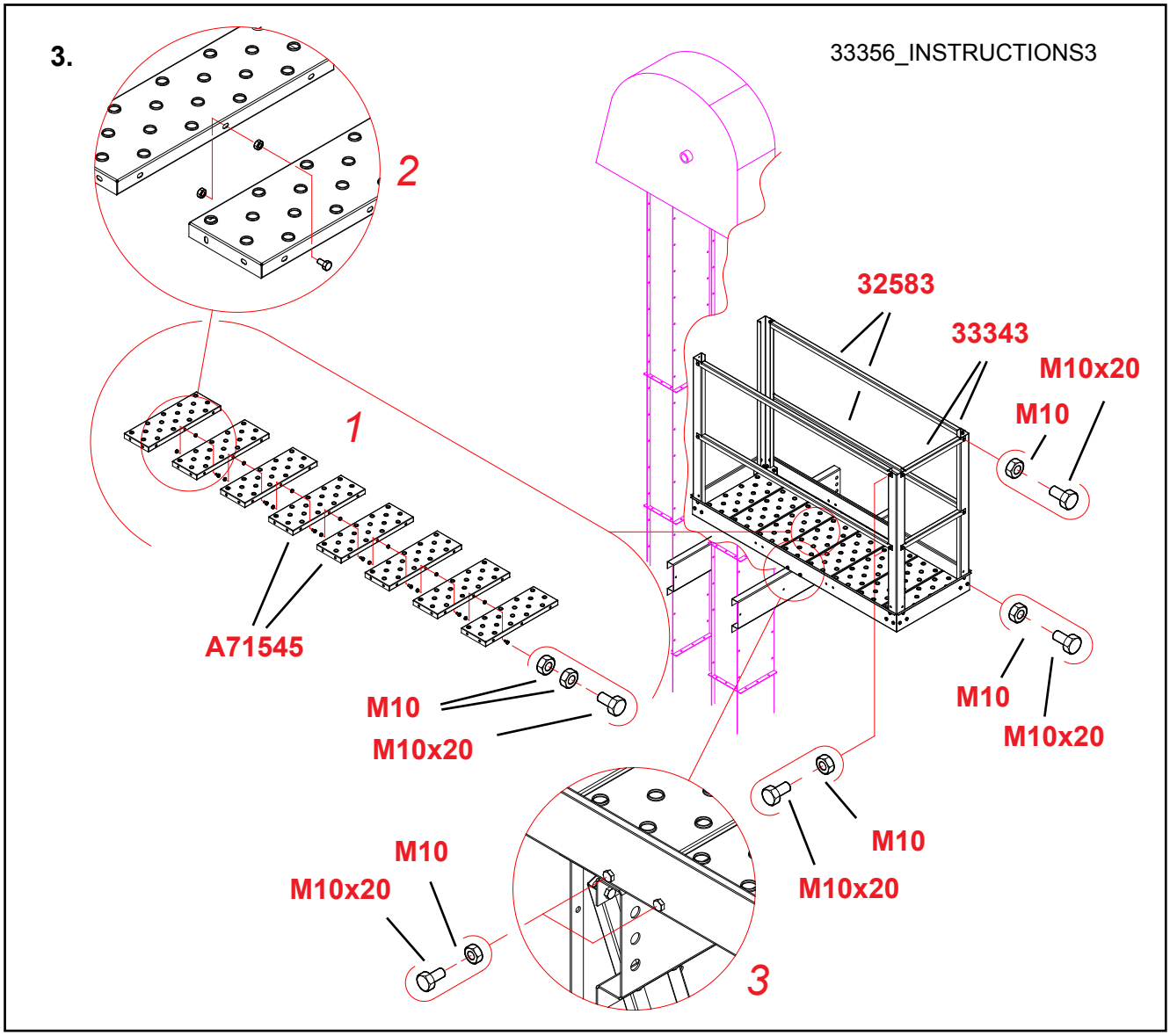
2. **Start the work by installing the frame beams (33338).**
   The service platform is placed on top of them.



Stage 2. Installing the lengthwise beams, the corner posts and the end beams.

1. **Install the lengthwise beams (33340) of the platform on the frame beams.**

2. **Attach to them the corner posts (32587) and the end beams (33341).**
   Fit the distance between the lengthwise beams to 637 mm and tighten the bolts.



Stage 3. Installing the platform elements and the handrails

1. **Join the platform elements (A71545) first together.**
   Put an M10x20 bolt and two M10 nuts in the midmost holes in the long edges of the elements so that one of the M10 nuts comes between the elements. See detail drawings 1 and 2.

2. **Fix the ready-assembled platforms by the ends of the midmost platform elements in the holes in the centre of the lengthwise beam.**
   See detail drawing 3.

3. **Fix the handrails (32583 and 33343) in place using bolts.**
   Leave out the short handrails from the top cover side to make an opening for access to the service platform.
   Attach the handrails of the service platform to the handrails of the top cover to make the structure sufficiently rigid.

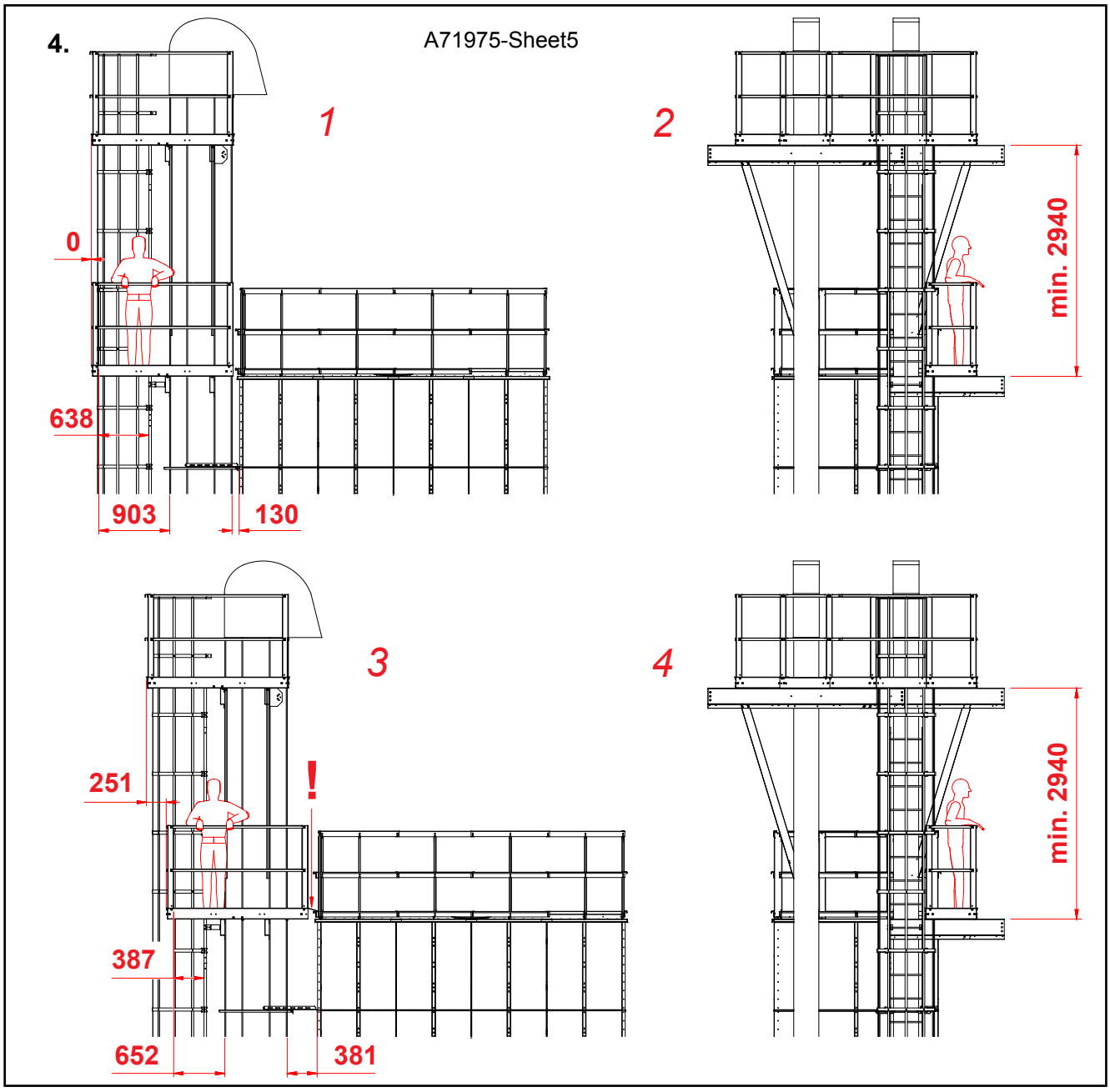


Fig. 4. Locating the 1-sided service platform (dimension drawing)

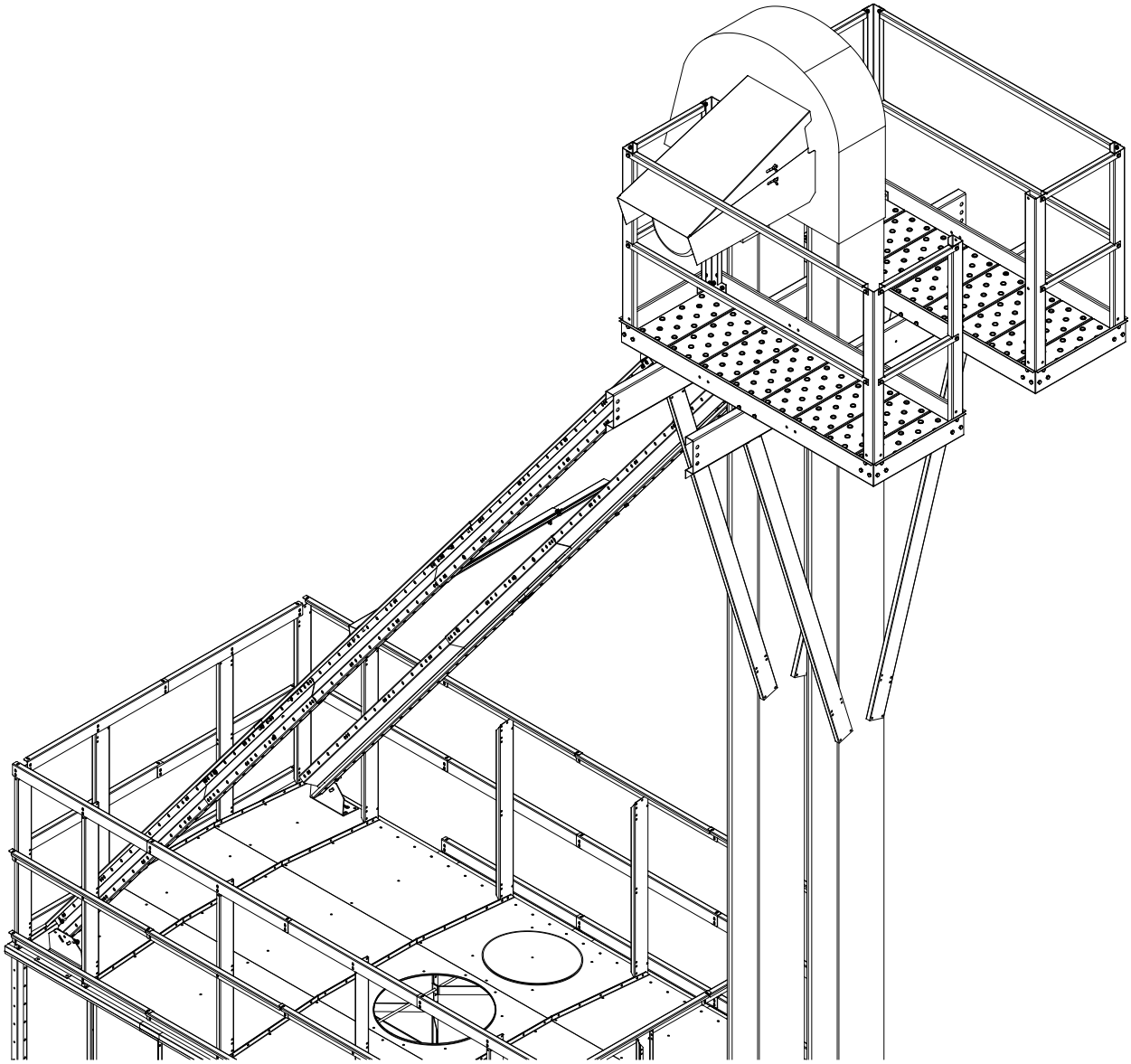
1. Elevator close to the dryer (drawings 1 and 2)
   * the upper and the lower service platforms one above the other at the side of the elevator (in the drawing the dimension is 0)
   * width of the access opening from the ladder to the platform 638 mm,
   * perpendicular distance from the corner post of the platform to the elevator 903 mm,
   * distance between the elevator pipe and the dryer 130 mm (the shortest possible distance with the elevator support 32535).

2. The distance between the elevator and the dryer long (drawings 3 and 4)
   * lower service platform transferred 251 mm towards the elevator (already-drilled holes in the lengthwise beams of the platform)
   * width of the access opening from the ladder to the platform 387 mm,
   * perpendicular distance from the corner post of the platform to the elevator 652 mm,
   * distance between the elevator pipe and the dryer 381 mm (the longest possible distance with the elevator support 32535).

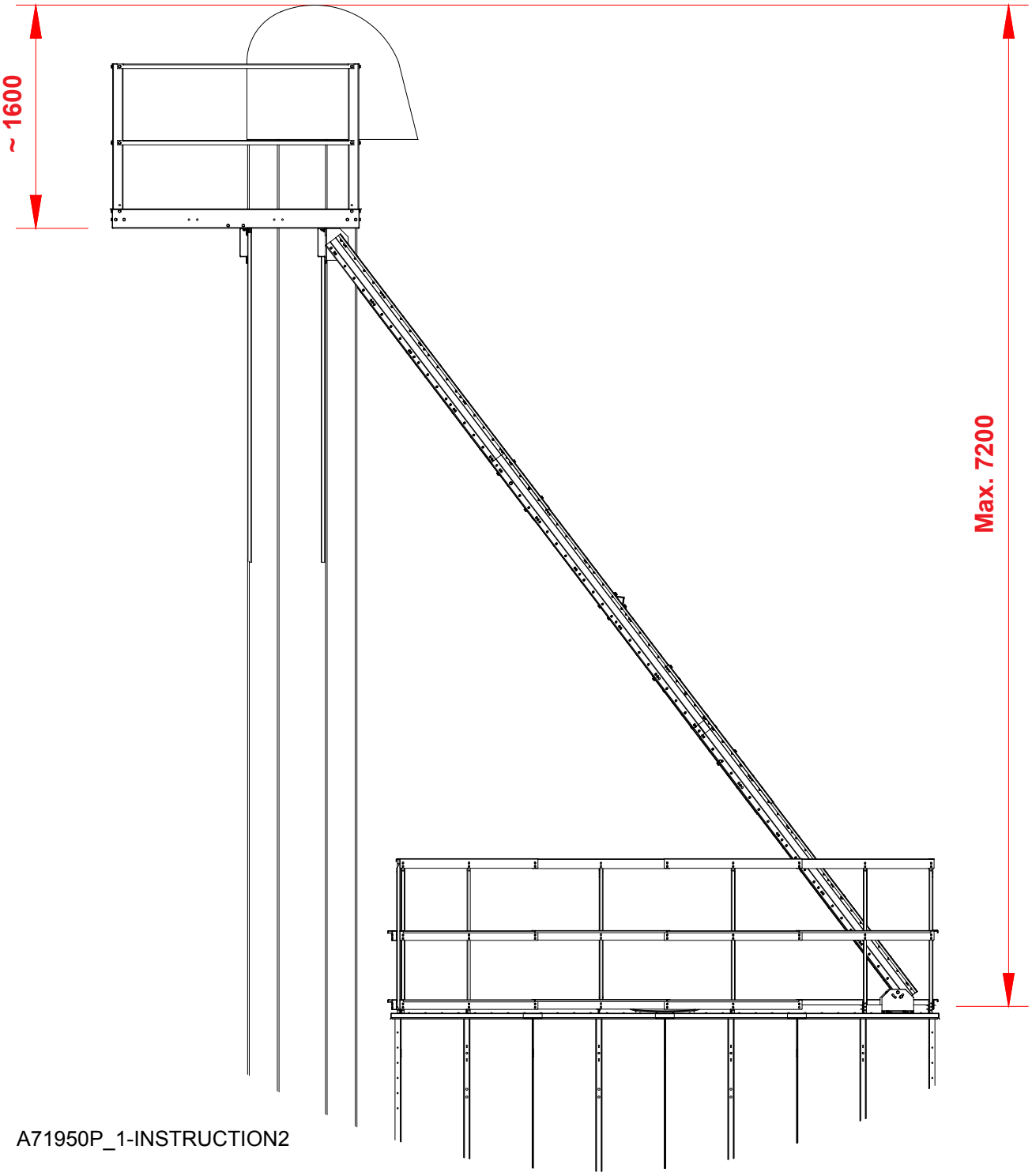
   As required, install a suitable steel plate to cover the space between the 1-sided service platform and the top cover of the dryer. See point ! in the drawing 3. Attach the plate to the end beam of the service platform, if the space is wider than 50 mm.

Elevator support (A71950P)

Supporting the elevator by its 2-sided service platform on the top cover of the dryer.

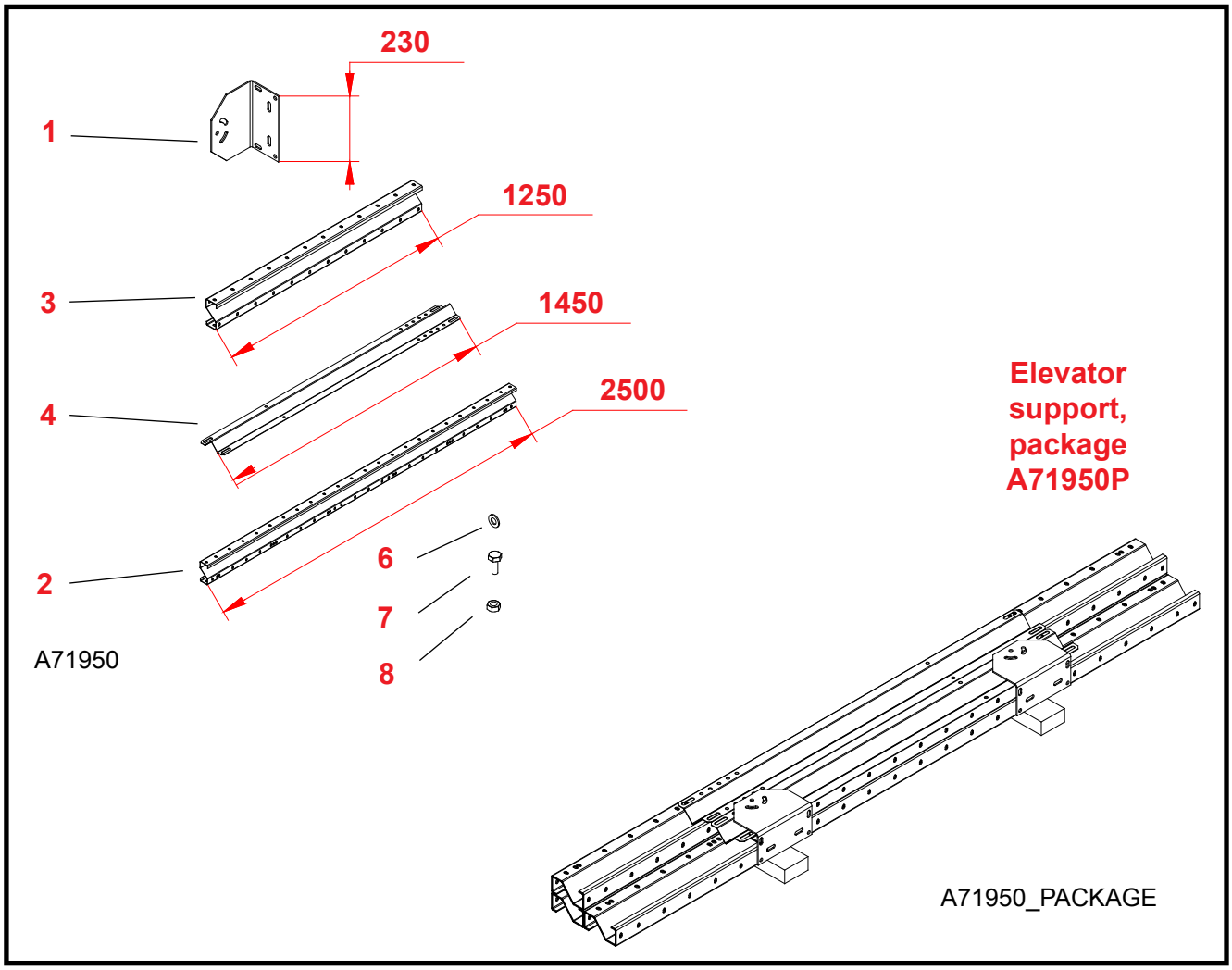


Dimension drawing for the elevator support (A71950P)



Structure of the elevator support (A71950P)

Parts of the elevator support (dryer with one or two elevators)



20080101

Ref.	Part no.	Denomination	Pcs	Dwg. No.	Weight
1	A71918	Elevator support, cover, upper bracket, E-model WM06	4	A71918-A	1.76
2	A71919	Cladding Z-beam L = 2500 WM06	6	A71919-0	14.79
3	A71916	Cladding Z-beam L = 1250 WM06	2	A71916-0	7.38
4	A71917	Elevator support, cover, cross support, E-model WM06	2	A71917-0	3.91
5	315440	Batten, L = 380 50x100			
6	111550	Washer ZN M10 DIN125	156		
7	102210	Hexagon bolt ZN M10x25 DIN933	78		0.02
8	110560	Hexagon nut M10 DIN934	78		0.01

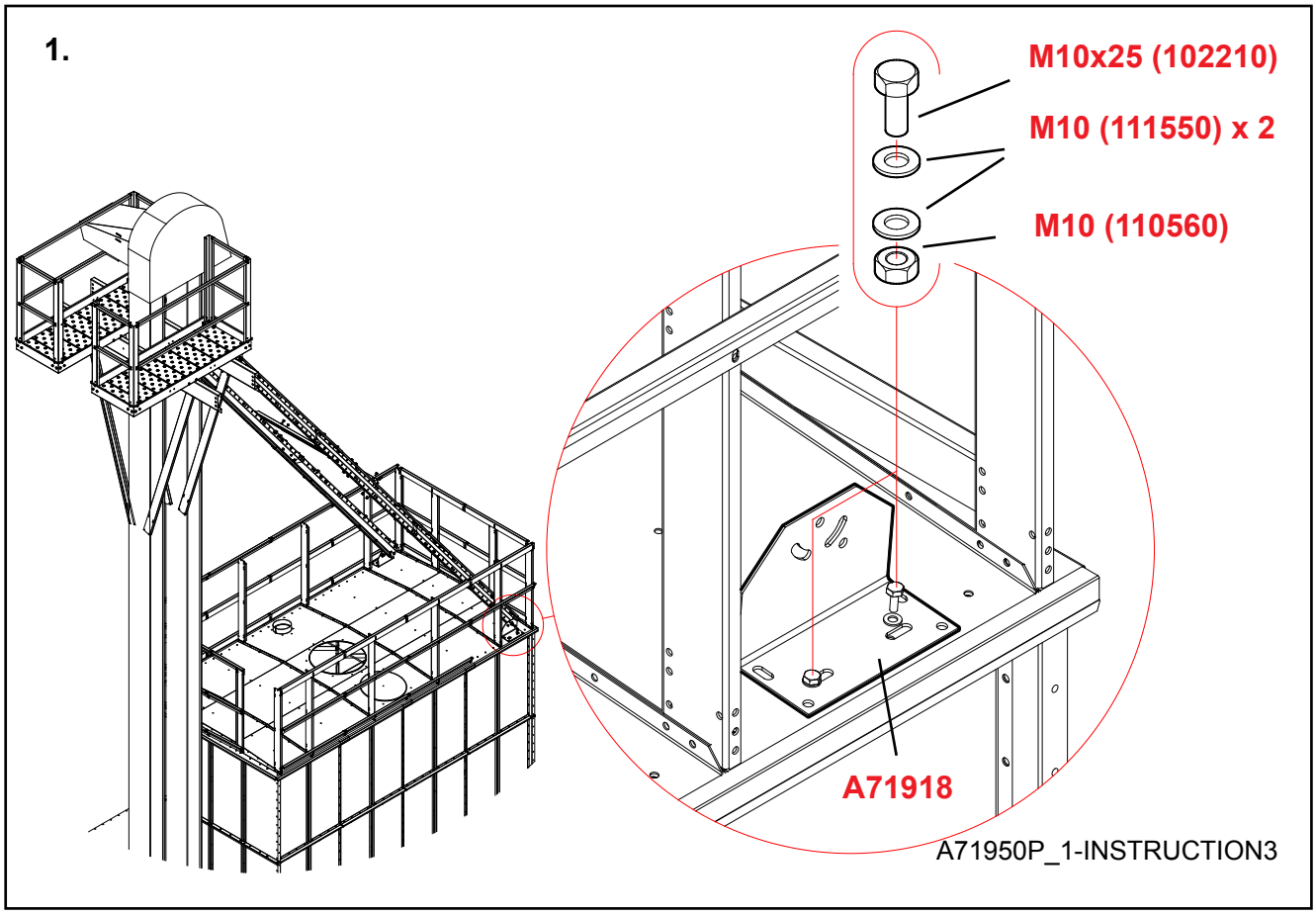
Installing the elevator support (A71950P)

DRYER WITH ONE ELEVATOR

Position the cross-braces for the cladding from the frame beam (33338) of the 2-sided service platform to the top cover of the dryer.

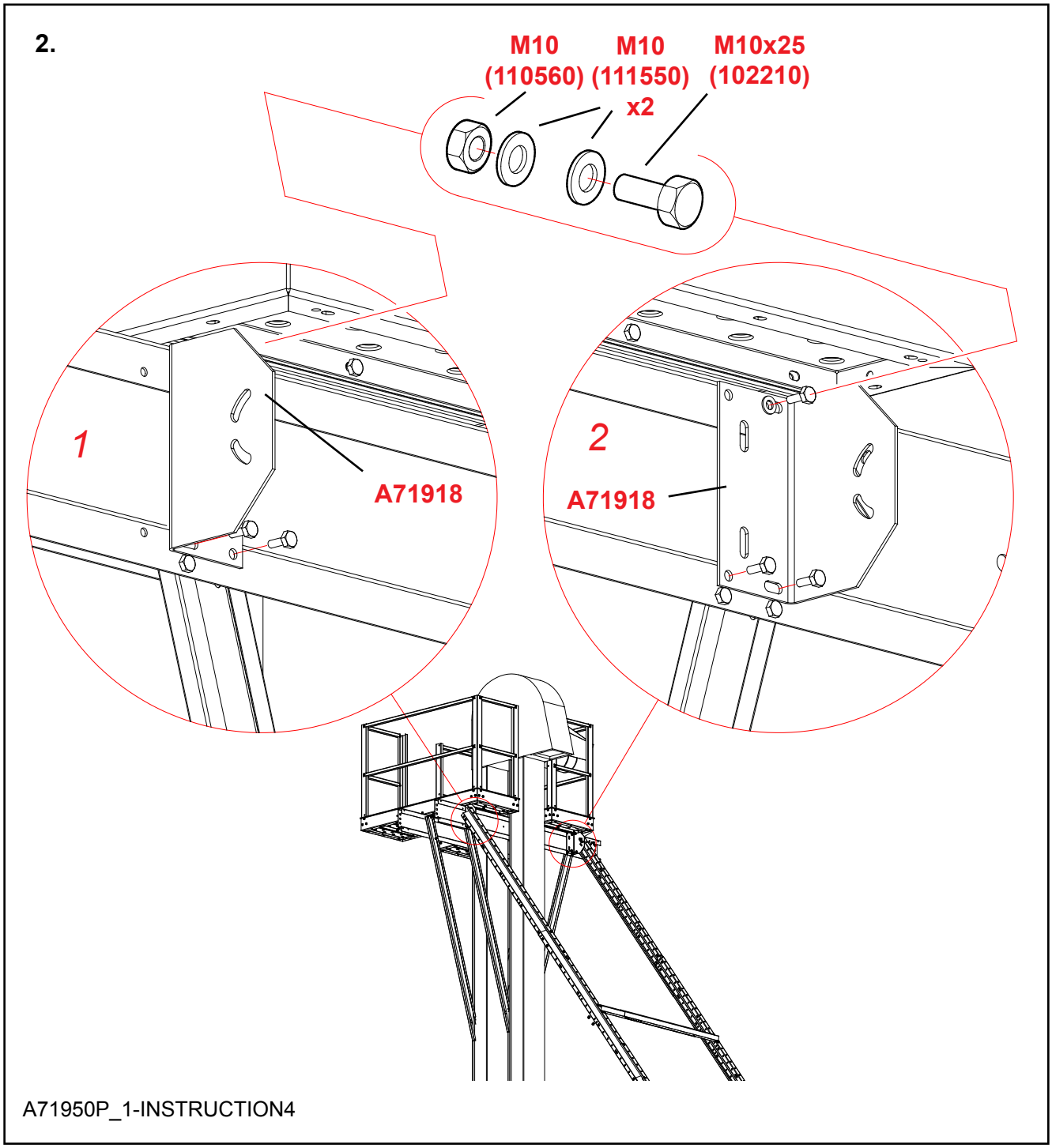
The length of the cross-braces is sufficient for installation of an elevator that extends approx. 7,2 m above the top cover of the dryer, measured from the top cover to the top of the elevator. This requires that the frame beam (33338) is installed about 1,6 metres below the top of the elevator.

In all installations, use M10x25 bolts, M10 nuts and, on both sides of plates to be attached, M10 washers.



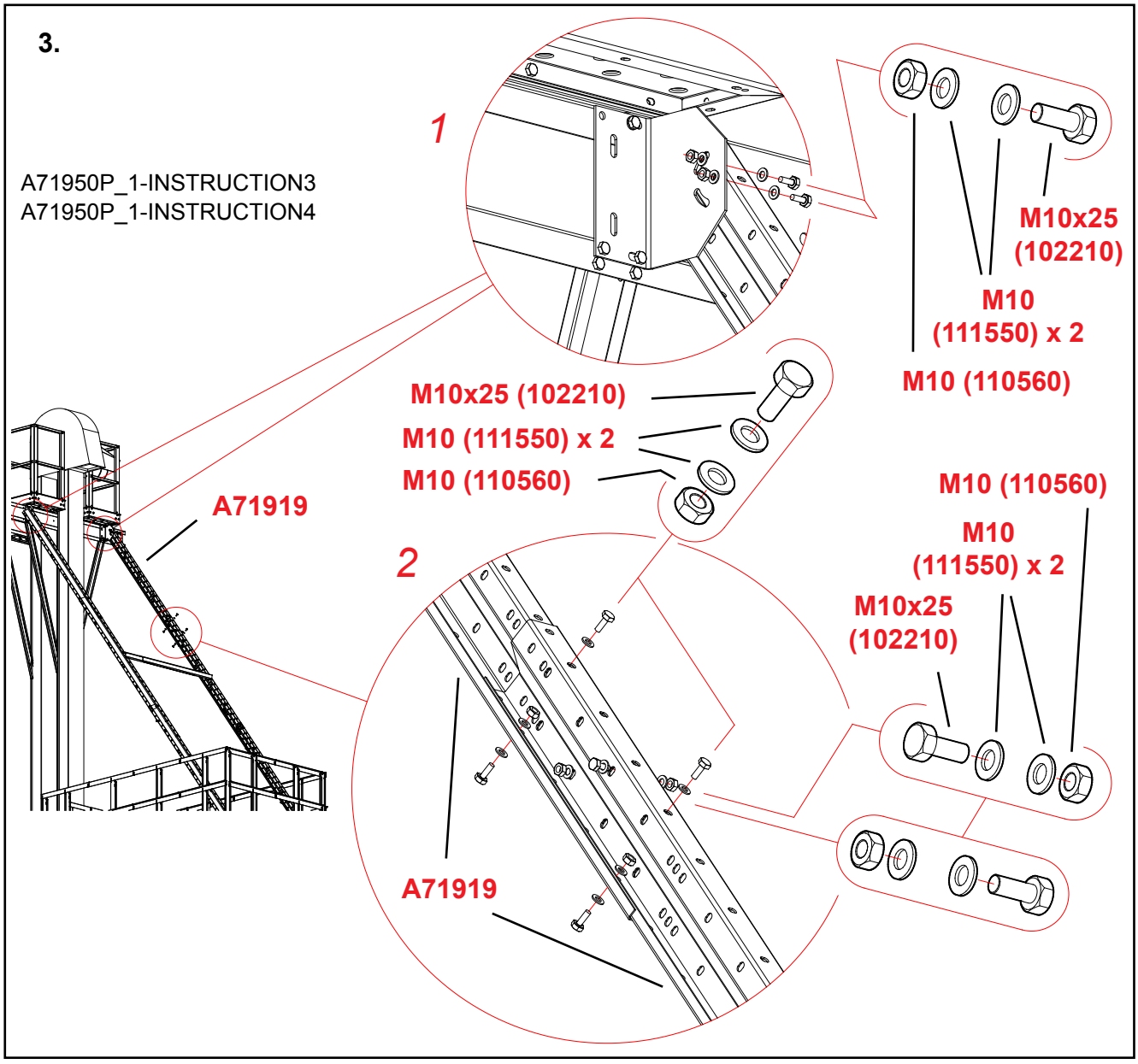
Stage 1. Installing the lower brackets for the cross-brace

1. **Attach the brackets for the cross-brace (A71918) to the cover with their angle pointing inward.**
   Install the brackets so that the cross-braces will be located inside the handrail of the dryer.
   Use two M10x25 bolts, washers and nuts for attachment (see drawing).
   Do not tighten the bolts yet at this stage.



Stage 2. Installing the upper brackets for the cross-brace

1. **Fix the brackets for the cross-brace (A71918) up in the frame beam at the cross-braces for the service platform.**
   The two uppermost bolts of the cross-braces must be removed to enable the attachment of the bracket's lower edge using these same bolts.
   Do not forget to install also the M10x25 bolt in the upper edge of the brace.
   See detail drawings 1 and 2.

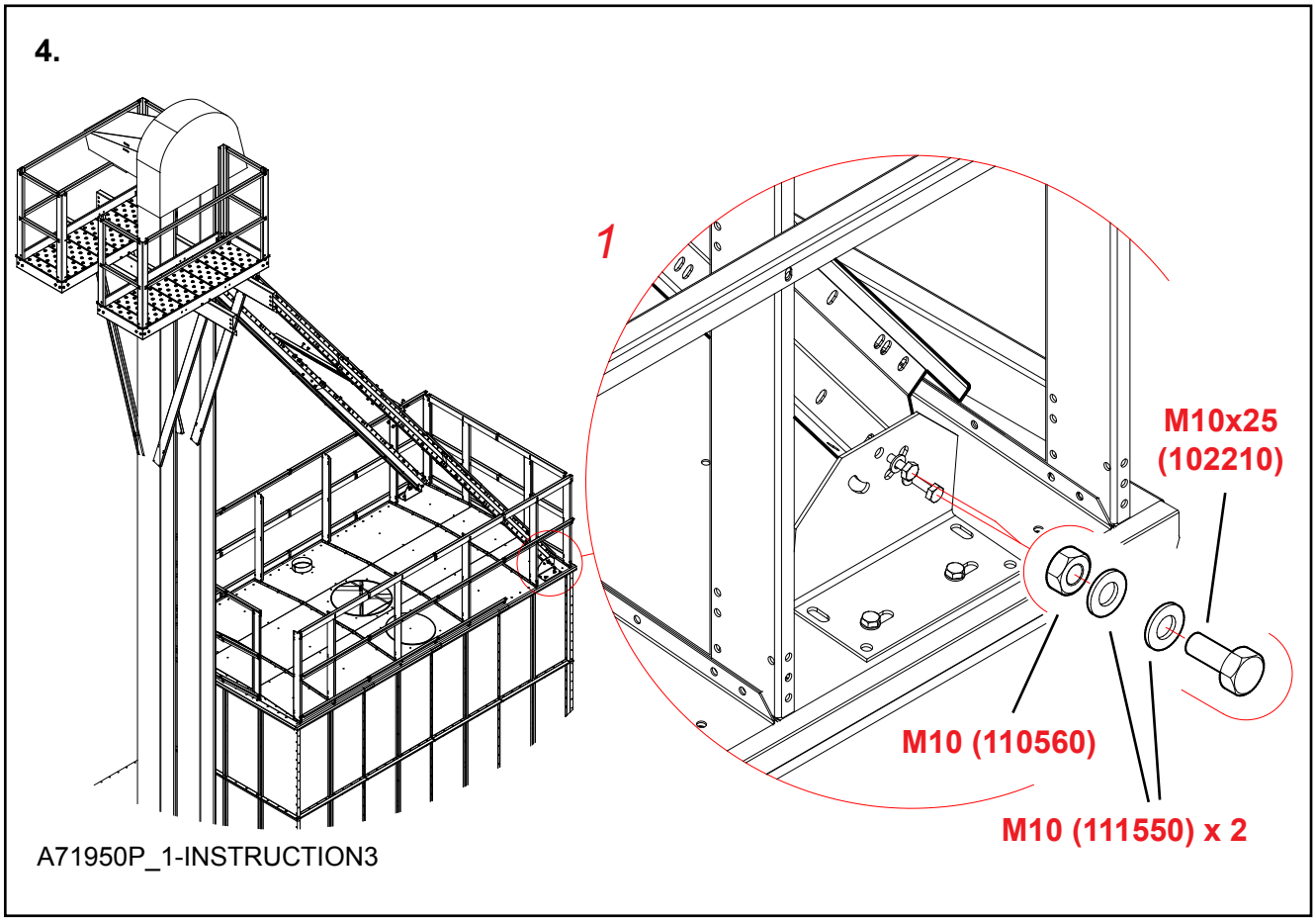


Stage 3. Assembling the cross-brace beams and their fixing in the upper brackets

1. **Fix the upper ends of the cross-brace beams (A71919) outside the brackets.**
   Use two M10x25 bolts, washers and nuts/brace for attachment (see detail drawing 1).
   Do not tighten the bolts yet at this stage.

2. **Put the braces one inside the other; they fit well together in one way only.**
   The braces must overlap at minimum across four holes, seen from the thinner side.
   Fix by the side-flanges using 2 bolts and by the centre-flange using 1 bolt/side (see detail drawing 2).
   Use M10x25 bolts, washers and nuts for attachment. Do not tighten the bolts yet at this stage.

- **Install required amount of beams in accordance with the total length of the brace.**
  Leave the attachment bolts in the Z-beams loose for fine-adjustment of the length.
  Fit the lower ends of the cross-braces in the brackets on the top of the dryer at stage 1.

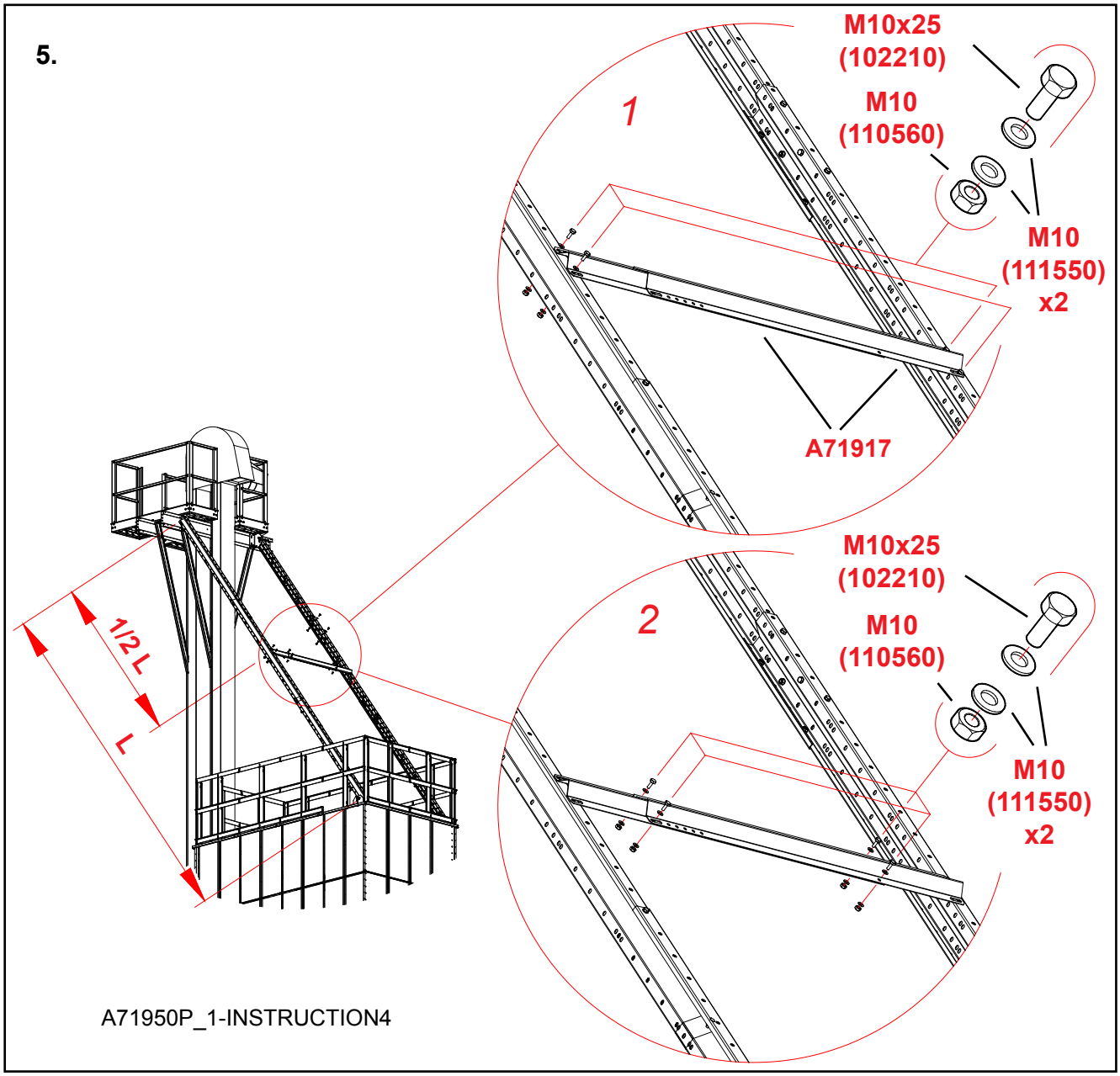


Stage 4. Fixing the cross-braces in the lower brackets and tightening the bolts

1. **Fix the lower ends of the cross-braces inside the brackets.**
   Use two M10x25 bolts, washers and nuts/brace for attachment (see detail drawing 1).
   Do not tighten the bolts yet at this stage.

- **After having adjusted the brace to its desired length, tighten first the bolts in the cross-braces.**
  Then the cross-brace will not sag while the attachment bolts for the braces are tightened.

- **Tighten the bolts in the upper and lower brackets for the cross-brace beams.**



Stage 5. Installing the cross-support on the cross-brace beams

- **Place the cross-support at the centre (in length) of the Z-beams (1/2 L).**

1. **Install the cross-support halves (A71917) in the centre of the Z-beams (detail drawing 1).**

2. **Attach the cross-support halves using two M10x25 bolts, washers and nuts/half.**
   Do not tighten the bolts yet at this stage.

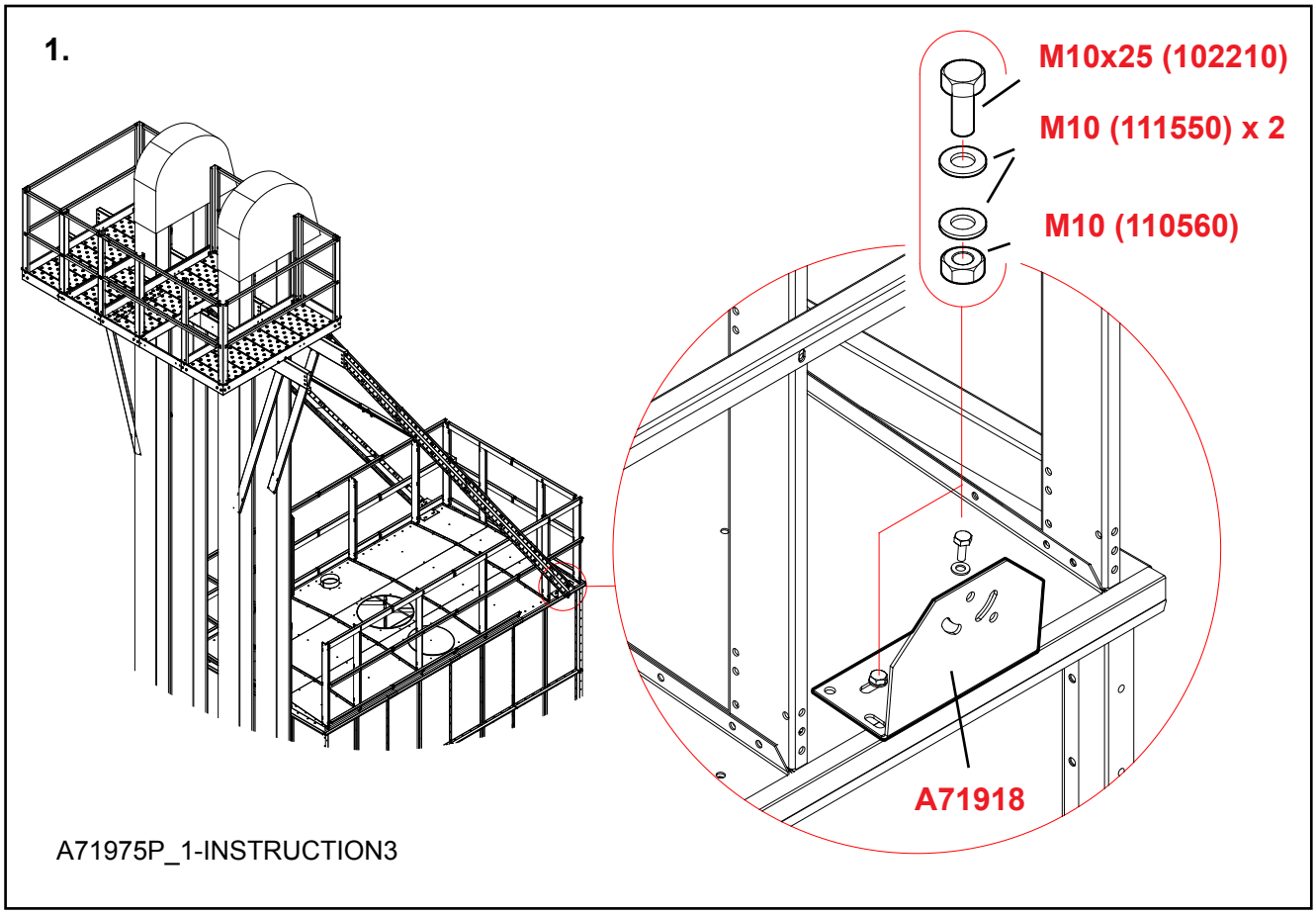
3. **Join the cross-support halves together using four M10x25 bolts, washers and nuts.**
   Tighten all the bolts in the cross-brace.

DRYER WITH TWO ELEVATORS

Position the cross-braces for the cladding from the frame beam 33338 of the 3-part service platform to the top cover of the dryer.

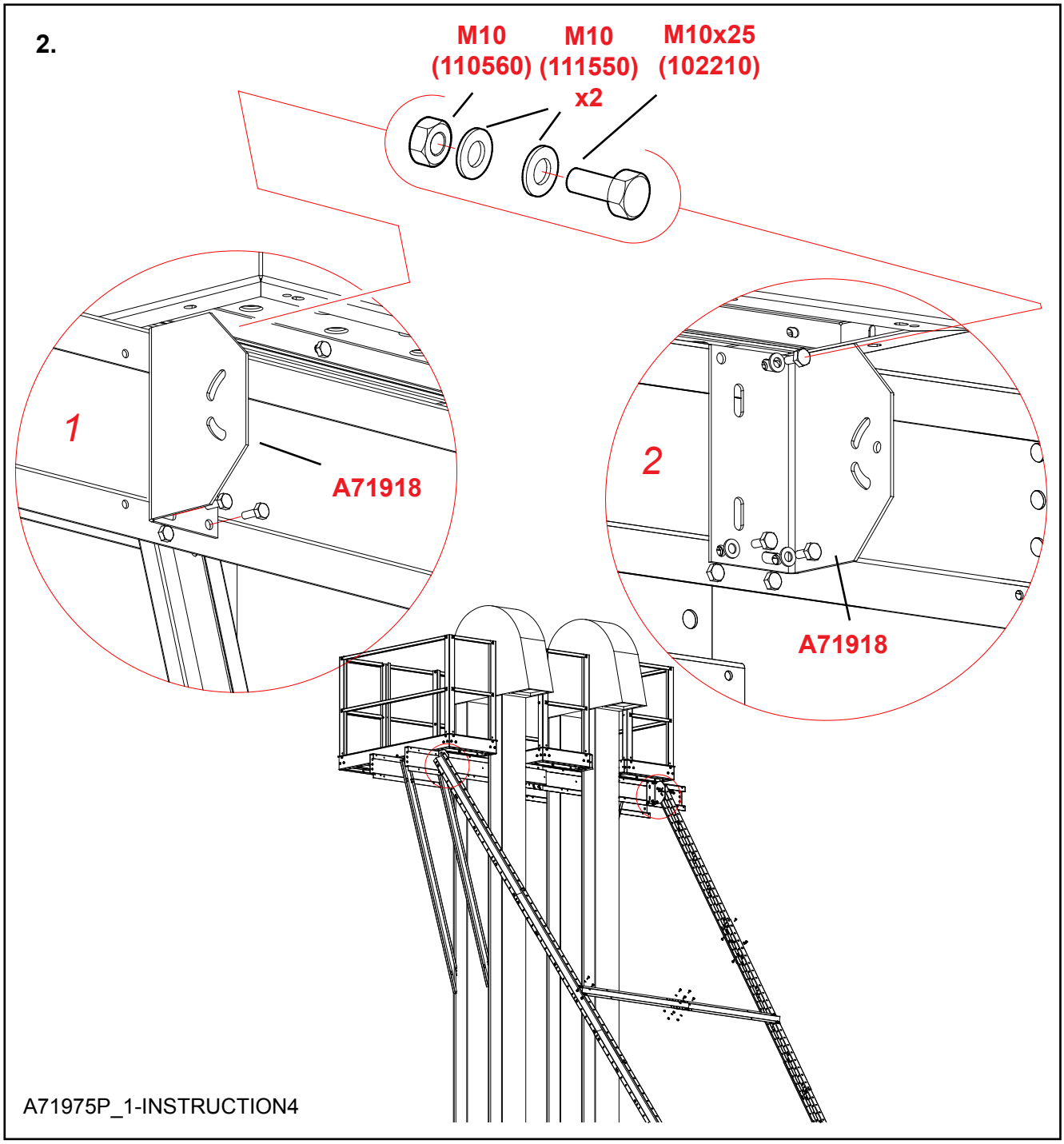
The length of the cross-braces is sufficient for installation of an elevator that extends approx. 7,2 m above the top cover of the dryer, measured from the top cover to the top of the elevator. This requires that the frame beam 33338 is installed about 1,6 metres below the top of the elevator.

In all installations, use M10x25 bolts, M10 nuts and, on both sides of plates to be attached, M10 washers.



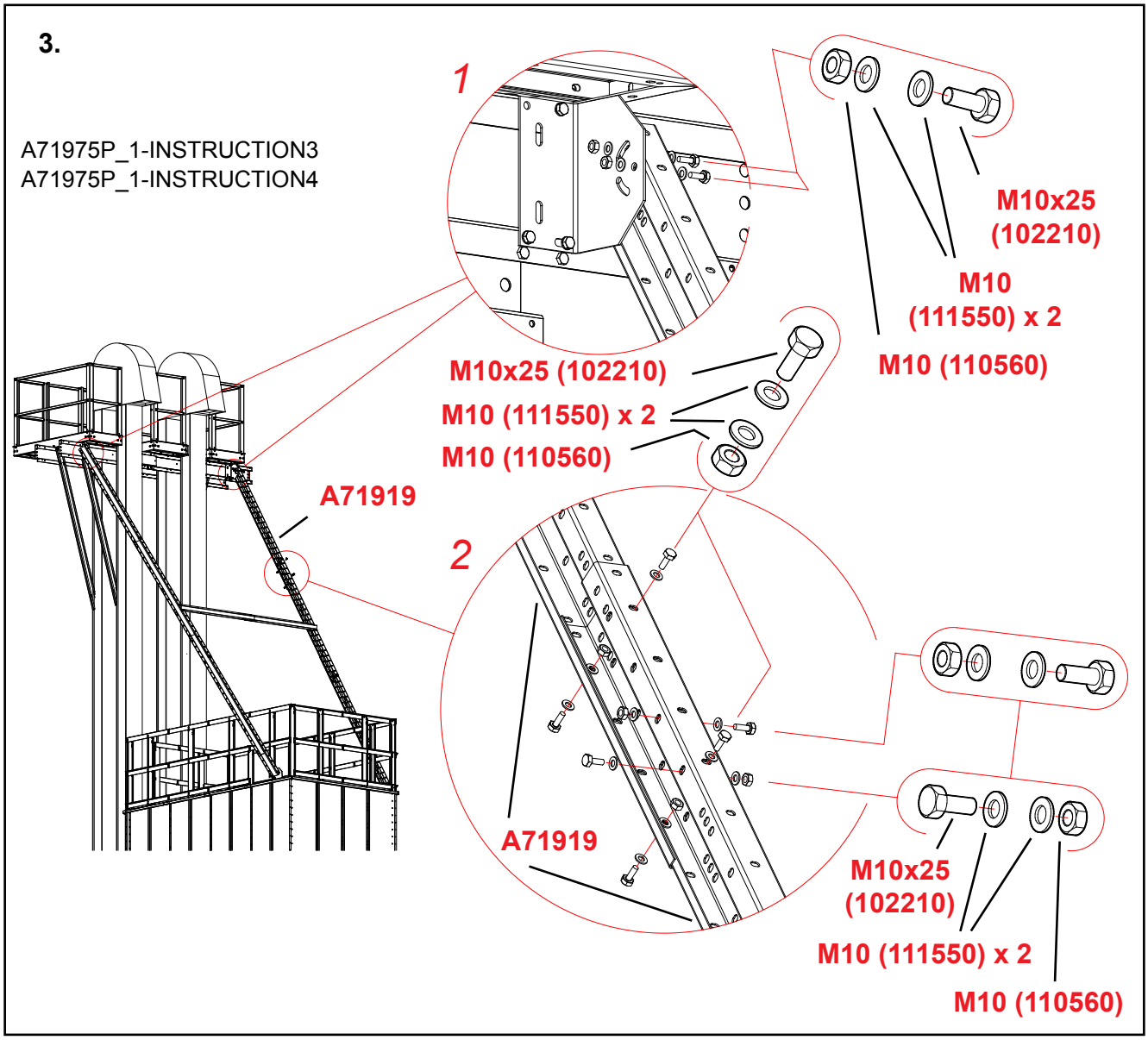
Stage 1. Installing the lower brackets for the cross-brace

1. **Attach the brackets for the cross-brace (A71918) to the cover with their angle pointing outward.**
   Install the brackets so that the cross-braces will be located outside the handrail of the dryer.
   Use two M10x25 bolts, washers and nuts for attachment (see drawing).
   Do not tighten the bolts yet at this stage.



Stage 2. Installing the upper brackets for the cross-brace

1. **Fix the brackets for the cross-brace (A71918) up in the frame beam at the cross-braces for the service platform.**
   The two uppermost bolts of the cross-braces must be removed to enable the attachment of the bracket's lower edge using these same bolts.
   Do not forget to install also the M10x25 bolt in the upper edge of the brace.
   See detail drawings 1 and 2.

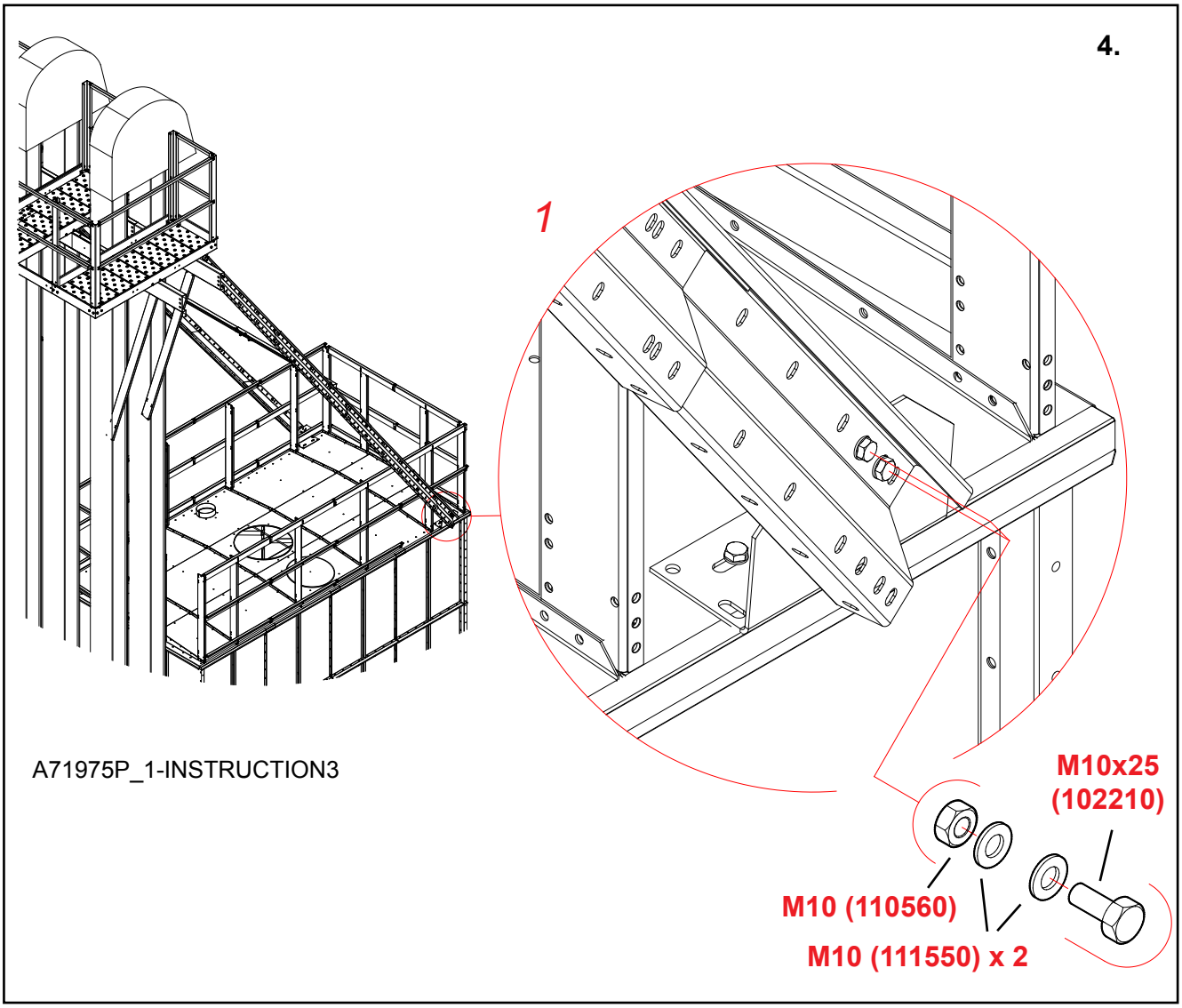


Stage 3. Assembling the cross-brace beams and their fixing in the upper brackets

1. **Fix the upper ends of the cross-brace beams (A71919) outside the brackets.**
   Use two M10x25 bolts, washers and nuts/brace for attachment (see detail drawing 1).
   Do not tighten the bolts yet at this stage.

2. **Put the braces one inside the other; they fit well together in one way only.**
   The braces must overlap at minimum across four holes, seen from the thinner side.
   Fix by the side-flanges using 2 bolts and by the centre-flange using 1 bolt/side (see detail drawing 2).
   Use M10x25 bolts, washers and nuts for attachment. Do not tighten the bolts yet at this stage.

- **Install required amount of beams in accordance with the total length of the brace.**
  Leave the attachment bolts in the Z-beams loose for fine-adjustment of the length.
  Fit the lower ends of the cross-braces in the brackets on the top of the dryer at stage 1.

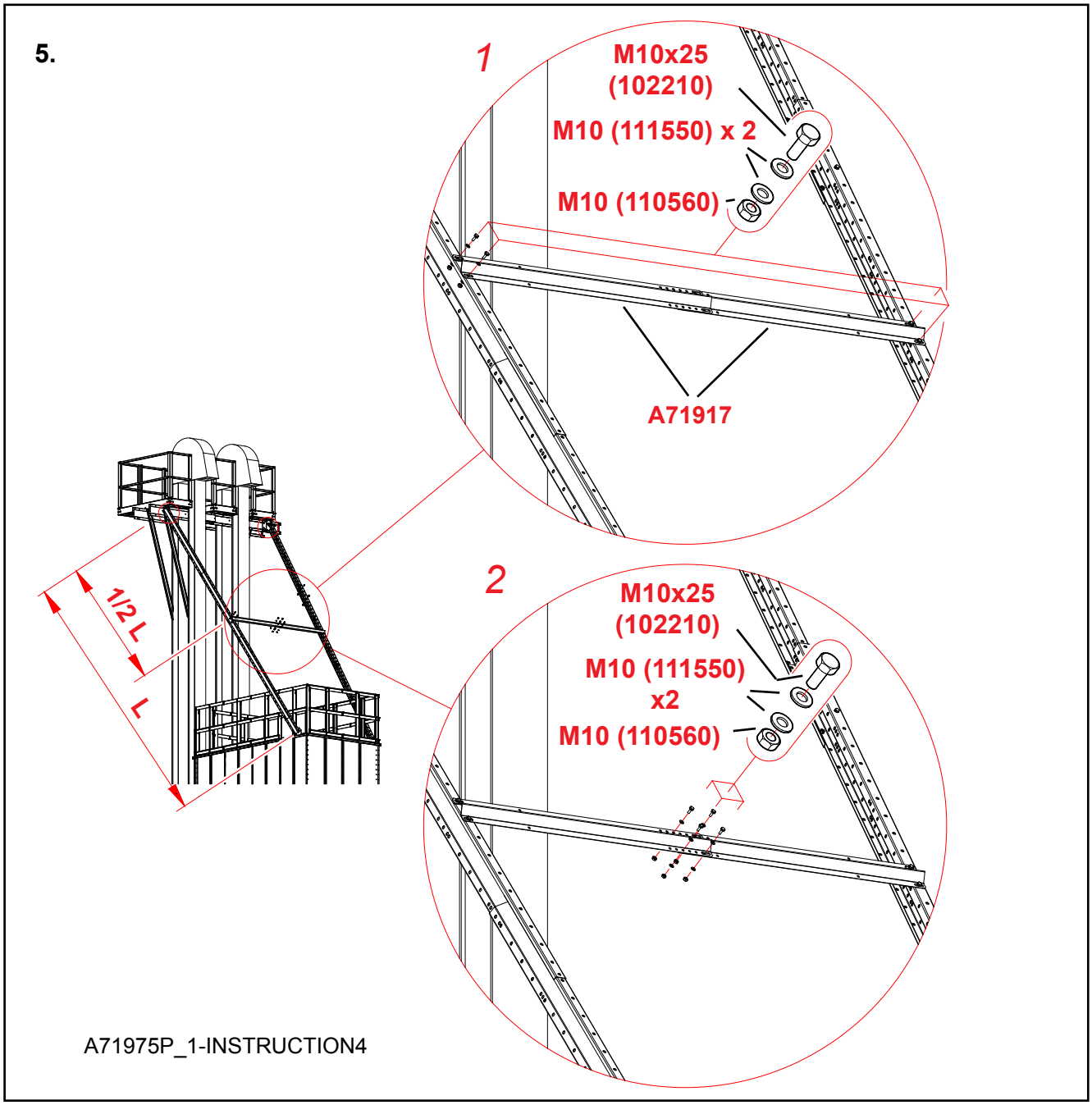


Stage 4. Fixing the cross-braces in the lower brackets and tightening the bolts

1. **Fix the lower ends of the cross-braces outside the brackets.**
   Use two M10x25 bolts, washers and nuts/brace for attachment (see detail drawing 1).
   Do not tighten the bolts yet at this stage.

- **After having adjusted the brace to its desired length, tighten first the bolts in the cross-braces.**
  Then the cross-brace will not sag while the attachment bolts for the braces are tightened.

- **Tighten the bolts in the upper and lower brackets for the cross-brace beams.**



Stage 5. Installing the cross-support on the cross-brace beams

- **Place the cross-support at the centre (in length) of the Z-beams (1/2 L).**

1. **Install the cross-support halves (A71917) in the centre of the Z-beams (detail drawing 1).**

2. **Attach the cross-support halves using two M10x25 bolts, washers and nuts/half.**
   Do not tighten the bolts yet at this stage.

3. **Join the cross-support halves together using four M10x25 bolts, washers and nuts.**
   Tighten all the bolts in the cross-brace.

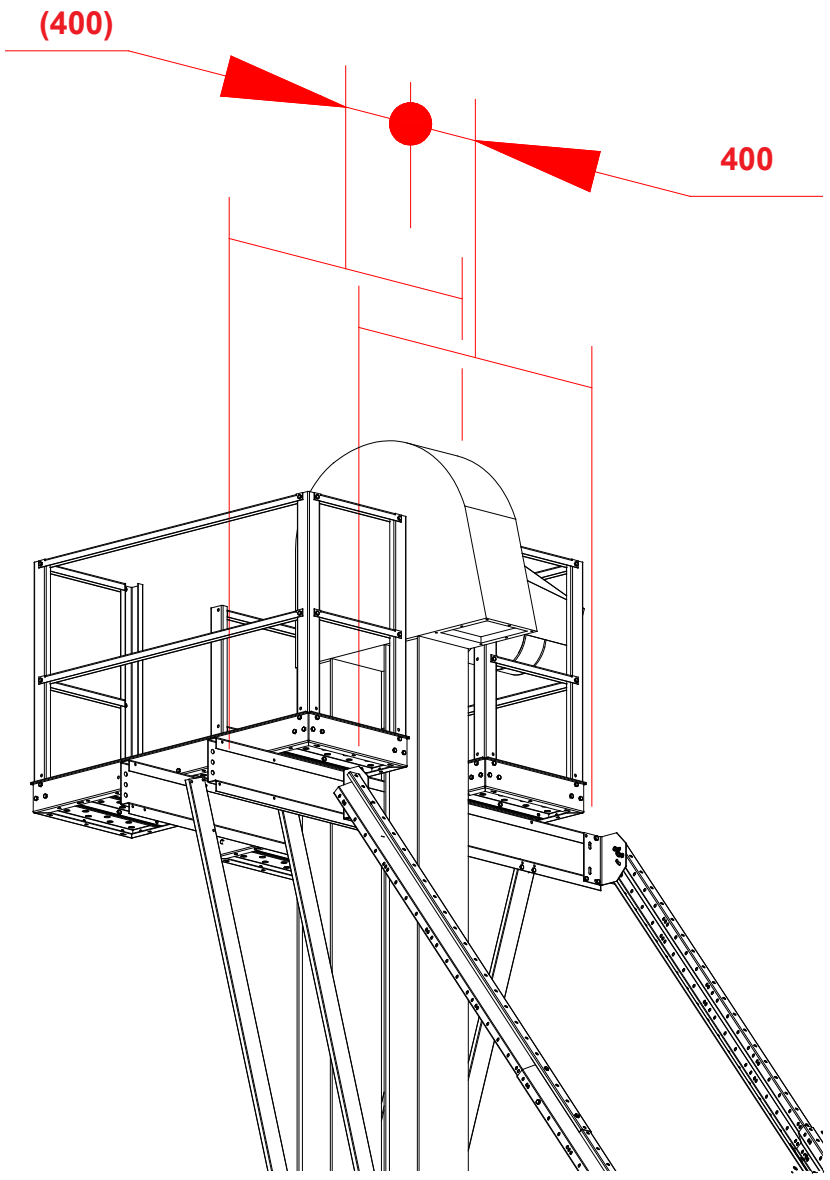
DRYER WITH ONE ELEVATOR, ECCENTRIC INSTALLATION OF THE ELEVATOR

Installing the upper brackets and cross-supports for the cross-brace

Using a chain conveyor requires that the elevator be transferred 400 mm to either left or right from the centre-line of the dryer. If the elevator installed at the side, it is possible to place the elevator as close to the dryer as possible and to use shorter extension legs.

Install the service platform on the elevator in accordance with the instructions above; only the location of the cross-brace brackets in the frame beam of the service platform is changed.

The length of the service platform's frame beam makes it possible to install the elevator with its service platform either on the right or on the left side. In this case the brackets for the cross-brace (A71918) are fixed asymmetrically in the ready-drilled holes in the frame beam of the service platform. In the drawing below the cross-brace brackets are placed in the right end of the frame beam.



Installing the upper brackets and cross-supports for the cross-brace; eccentric installation of the elevator

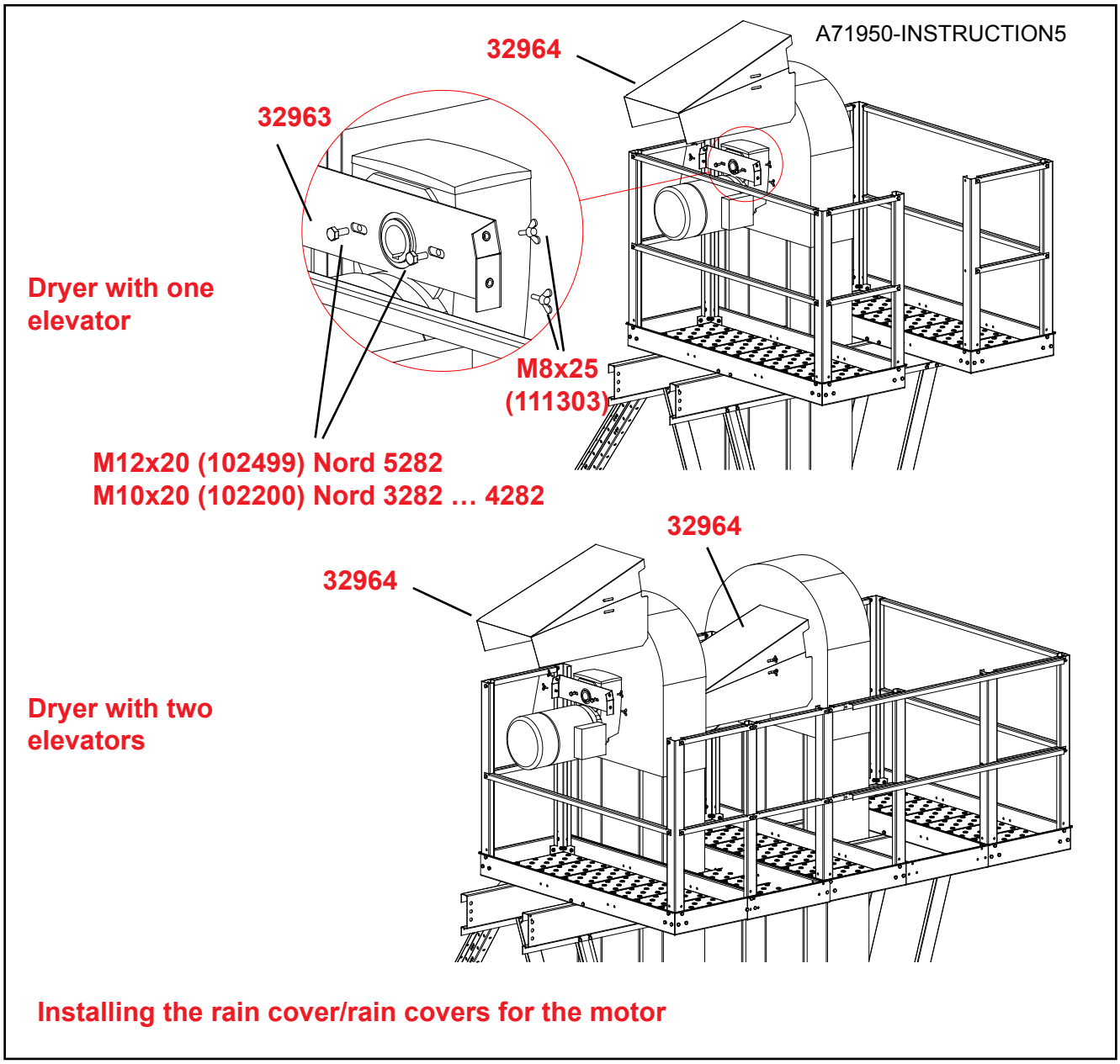
Installing the rain cover/rain covers for the motor

DRYER WITH EITHER ONE OR TWO ELEVATORS

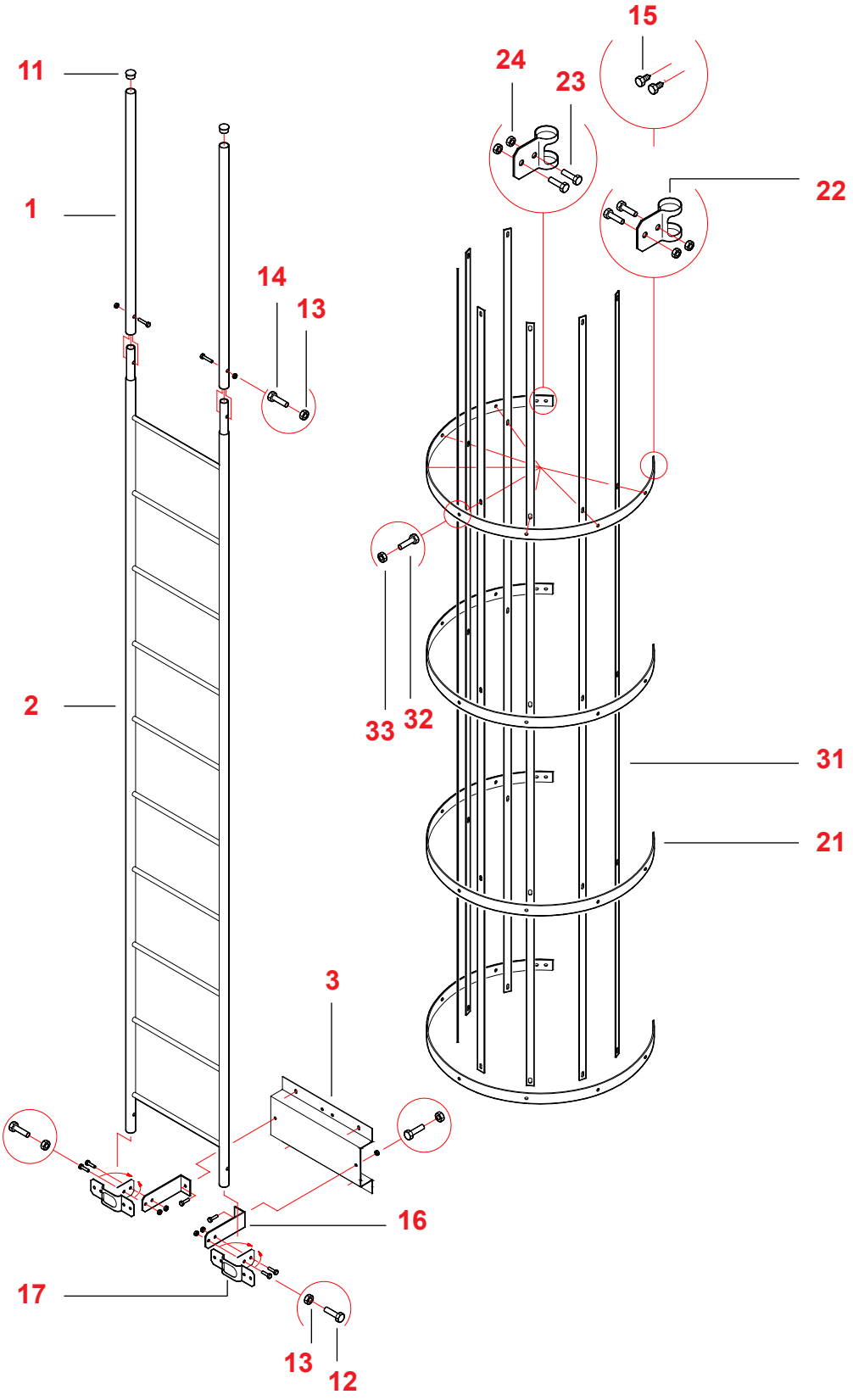
1. **Fix the rain cover bracket (32963) to the gear housing of the gear motor.**
   The bolts size in Nord 4282 gear motors is M10x20 and in Nord 5282 type it is M12x20.

2. **Align the centre hole of the bracket with the shaft hole and tighten the bolts (2 pcs.), see the drawing.**

3. **Fix the rain cover (32964) in the bracket using wing screws.**



Parts of PAK ladder and guard-rails



20080101

Ref.	Part no.	Denomination	Pcs	Dwg. No.	Weight
1	33428	Upper exit rail	2		
2	33426	Ladder element 3M	*)		
3	33342	Ladder bracket	2	/ fitting package	

Ref.	Part no.	Denomination	Pcs	Dwg. No.	Weight
-	**42473**	Ladder 3M M04 fitting package (incl. parts 11-18)	1	/ ladder element	
11	116110	Plastic plug U 32	2		
12	101850	Hexagon bolt ZN 8.8 M8x30 AM DIN933	13		
13	110540	Nut M8 ZN DIN934	17		
14	101870	Hexagon bolt ZN 8.8 M8x40 DIN933	4		
15	107749	Self-tapping screw D 8.0 x 19 ZN 6K	6		
16	506055	PAK ladder clamp 32105	4		
17	33434	PAK ladder clamp 3M M04 count.part for ladder clamp ZN	4		
18	300647	Carton 180 x 110 x 170 NO 0 ÖHM	1		

Ref.	Part no.	Denomination	Pcs	Dwg. No.	Weight
-	**42483**	Ladder 3M M04 guard-arc package (incl. parts 21-24)	*)		
21	33342	PAK ladder 3M M04 guard-arc ZN	4		
22	33434	PAK ladder clamp 3M M04 count.part for ladder clamp ZN	8		
23	101850	Hexagon bolt ZN 8.8 M8x30 AM DIN933	60		
24	110540	Nut M8 ZN DIN934	60		

Ref.	Part no.	Denomination	Pcs	Dwg. No.	Weight
-	**42484**	Ladder 3M M04 back-arc package (incl. parts 31-33)	*)		
31	33433	PAK ladder clamp 3M M04 back-arc ZN	7		
32	101850	Hexagon bolt ZN 8.8 M8x30 AM DIN933	4		
33	110540	Nut M8 ZN DIN934	4		

*) = amount in determined by the elevator height

Installing the PAK ladder and guard-rails

The length of the ladder elements is 3 m. Assemble the ladder on the ground and after that attach it to the elevator at the opening in the service platform using M8x30 hexagon bolts and nuts. The delivery includes the required amount of ladder elements, according to the height, ladder brackets, fitting boxes for elements (1 / element) and two pieces of upper exit rails.

Begin the dimensioning of the ladder by placing the uppermost rung at the edge of the service platform. Cut off possible excess length from the lowermost ladder element.

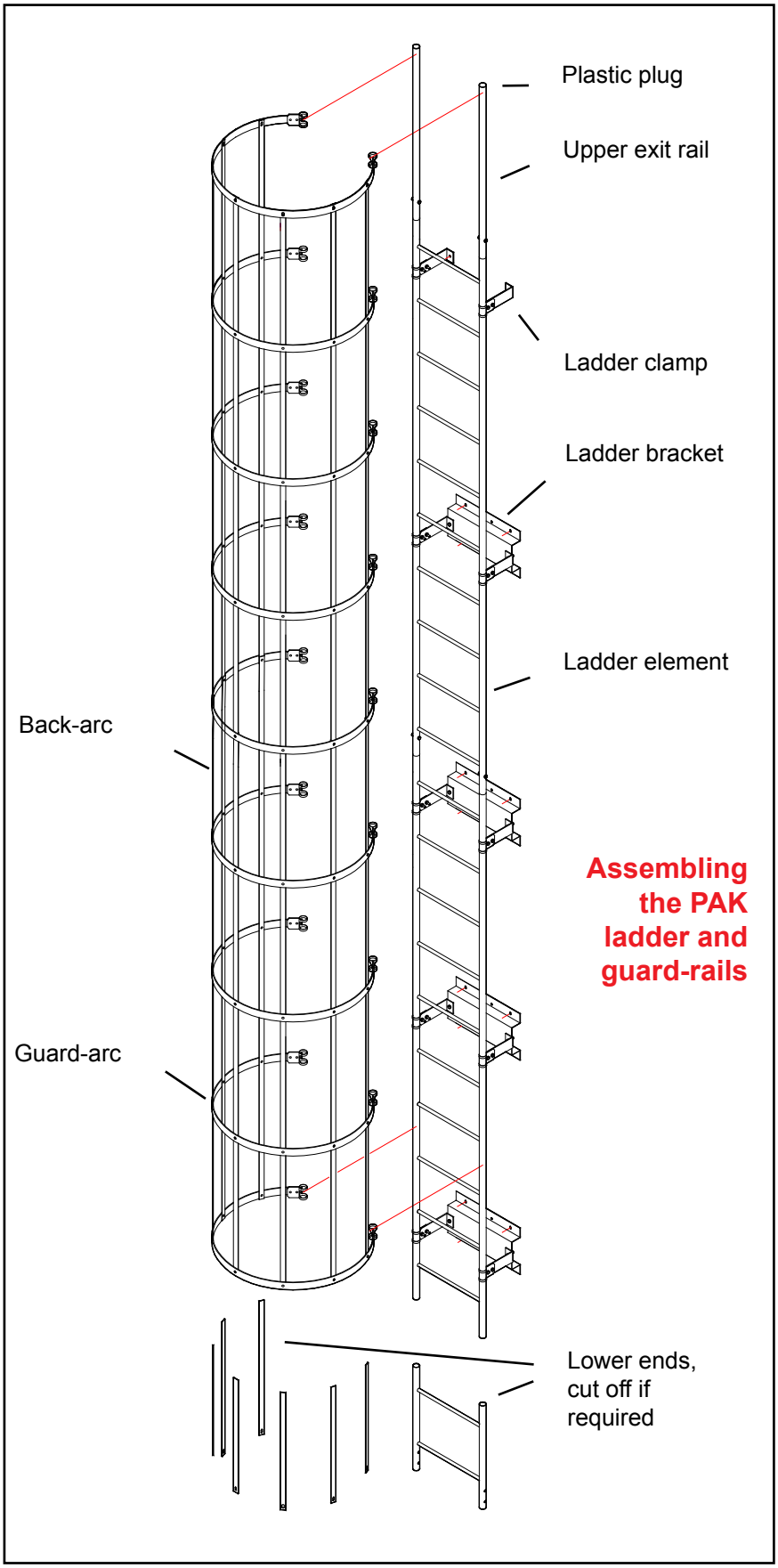
Attach the upper exit rails to the upper end of the ladder using M8x40 hexagon bolts and nuts. Plug the upper ends of the rails using plastic plugs.

Place the uppermost ladder clamp pair below the uppermost rung. Install the ladder clamp pairs at intervals of 1,4-1,6 metres. Attach the ladder brackets to the clamp pairs using M8x30 hexagon bolts and nuts. Equalise the distance between the lower pairs of ladder clamps so that the lower edge of the ladder is well supported.

Join the ladder elements together using the M8x40 hexagon bolts and nuts in the fitting package.

Fix the ladder to the ladder brackets using M8x30 hexagon bolts and nuts.

Continues on next page >>>



Assembling the PAK ladder and guard-rails

>>> continued from previous page

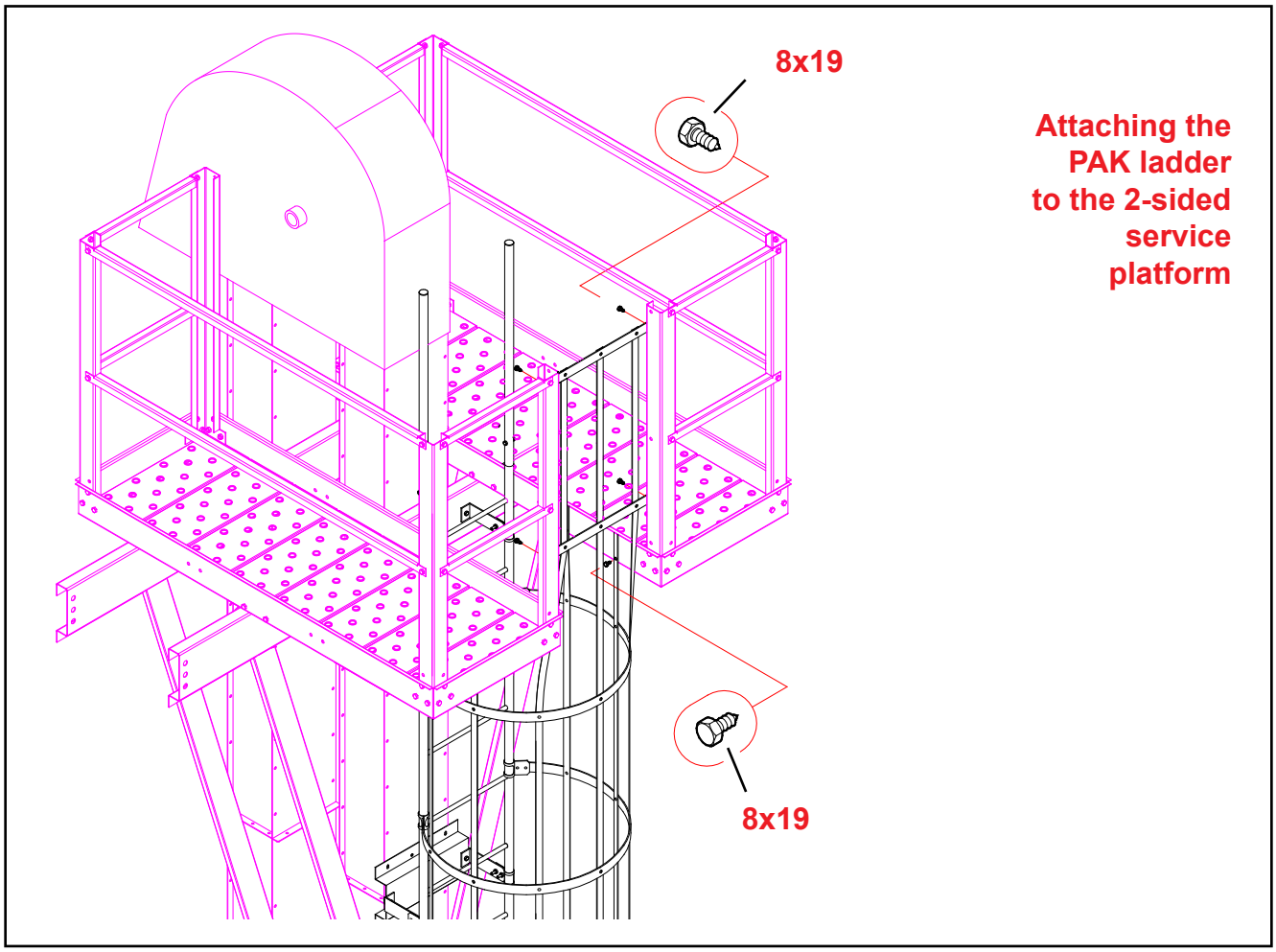
If the lowest ladder element is too long, cut off the excess length.

Install the back rails at a height where the uppermost guard-arc comes level with the handrail of the uppermost service platform. Attach the rails to the wall ladder by fitting the counterparts of the ladder clamps in the ends of the guard-arcs.

Attaching the PAK ladder to the 2-sided service platform

Install the guard-arcs for the ladder - all the way up. Cut and straighten the two uppermost guard-arcs at their both ends and fix them in the corner posts of the service platform using 8x19 self-tapping screws. This joins the service platforms and the guard-arcs together and makes the structure sufficiently rigid.

Cut two back-arcs of the ladder at both sides, at the 2-sided service platform, and attach the ends of the cut-off guides to the lengthwise beams of the service platforms. Use 8x19 self-tapping screws for attachment to the lower edge of the beams so that the screw caps come under the platform elements.



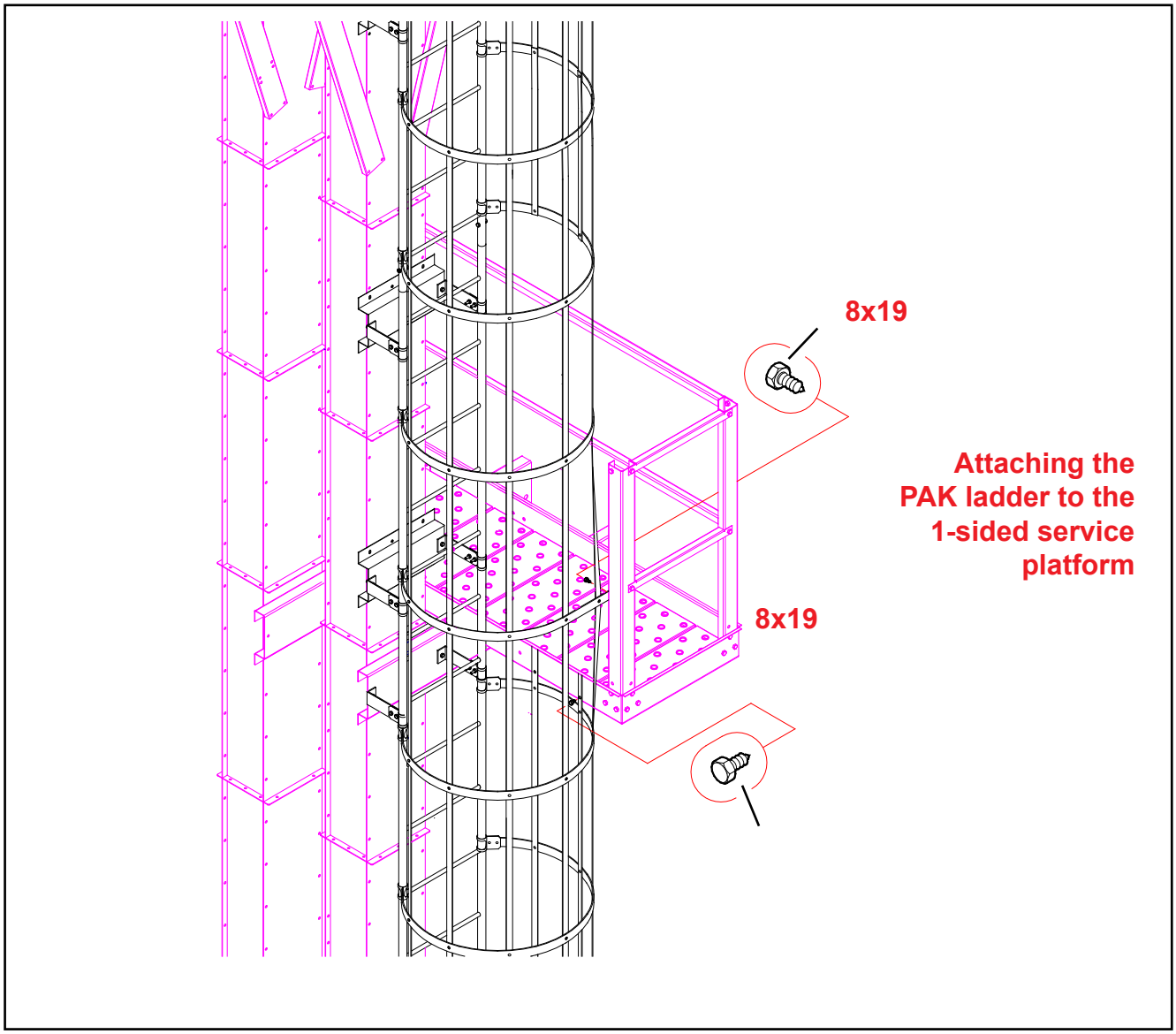
Attaching the PAK ladder to the 2-sided service platform

Attaching the PAK ladder to the 1-sided service platform

Cut and straighten one or two guard-arcs at their other end attach them to the corner post of the service platform using 8x19 self-tapping screws.

Cut two back-arcs of the ladder at the 1-sided service platform to enable access from the ladder onto the platform.
Attach the ends of the cut-off guides to the lengthwise beams of the service platform. Use 8x19 self-tapping screws for attachment to the lower edge of the beams so that the screw caps come under the platform elements. Cut the back-arcs at the upper edge of the access opening along the lower surface of the guard-arc.

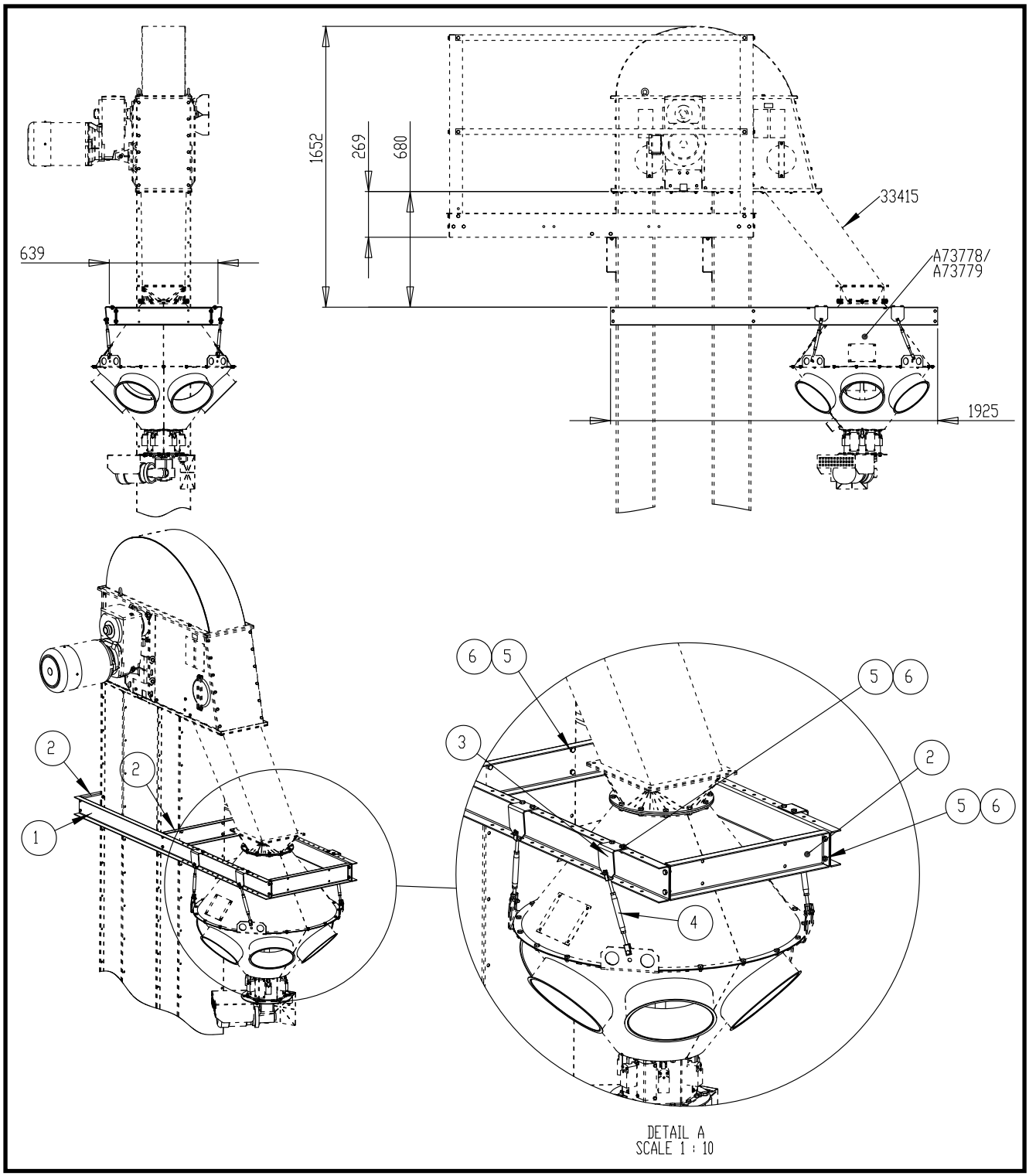
Install the lowermost guard-arc at a distance of 2,5 - 3 m from the ground. Use the original holes in the back-arcs. Cut the back-arcs on a level with the lower surface of the guard-arc.



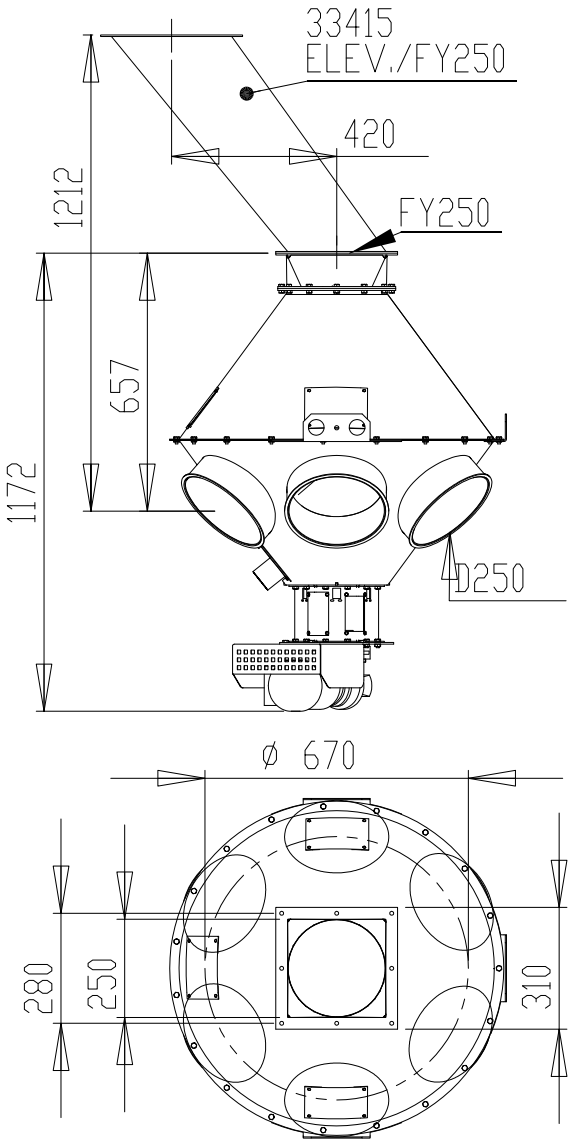
Support package 33425 for the 6-way divider with dimension drawing

Always support the divider carefully. The 6-way divider **MUST NOT** be supported by the conversion part of the elevator. The pipes must not load the divider either. The pipes must be supported at their first joint.

Take a note of the service platform's position, when you use the support package for the divider 33425.



Ref	Item ID	Name	Pcs
1	33423		2
2	33422		3
3	A73965		4
4	115646	RIGGING SCREW M8 VRH08	4
5	101810	SCREW 6K ZN 8X16 DIN933	28
6	110540	NUT M8 DIN 934	28



OPERATING INSTRUCTIONS FOR THE ELEVATOR

Initial adjustment and checking of the elevator

**Warning! During initial set-up, the elevator must be operated also with its control and service hatches open, which requires that particular caution be exercised.
Risk of injury!**

We recommend carrying out the following adjustments and controls before the essential test run and start-up:

1. Is the bucket belt of the elevator running in the centre of the pulleys and the frame pipes (to ensure quiet running)

If this is not the case, then check:
* upright position of the frame pipes using a plumb line,
* upright position of the elevator boot using a spirit level,
* upright position of the elevator top using a spirit level

If the above-mentioned controls prove necessary, unscrew the attachment screws for the bucket pulley bearing and adjust the position of the pulley using a hexagon socket key as required to make the bucket belt run in the centre of the pulley.

2. Adjusting the position of the bucket belt pulley scraper at the elevator boot

Adjust the plate to as close to the surface of the pulley as possible, however, allowing the elevator to run without making any abnormal noise. If the edge of the scraper comes in contact with the bucket belt pulley or the gap is wider than necessary, carry out the adjustment (drawing "Setting the scrapers").

3. Adjusting the position of the bucket belt pulley scraper at the elevator top

Adjust the scraper in the same way as in the boot.

4. Checking the position of the adjustment plate above the divider inside the elevator top

As necessary, adjust the position of the plate so that the buckets will pass the adjustment plate at a distance of 10 mm.

5. Checking the bucket belt for tightness and retightening

If the bucket belt has been in place for 1 - 2 weeks after the installation, it can be retightened before the test run or first start-up, if necessary.

Attach the joining device for the belt to the rear of the belt in the rear opening in the pipe (to the screw holes of the two buckets that were removed temporarily) on both sides of the bucket belt joint. Wind the tool open until it spans 4 - 5 hole pairs. Tighten the belt using the tool. The tightness of the belt is correct when the screw holes in the belt are stretched slightly oval. If the belt is stretched to the point that making a new joint with new holes becomes possible, open the joint, cut off the excess length, drill new holes, and make a new joint by using the joining irons. Put back in place the buckets that you removed to make space for the joining device after having removed the device. Note that in the bucket groups the number of buckets without bottom may differ from the standard amount (five), but the lowermost bucket in each group must always have a bottom and an unused pair of holes must always be left below every bucket with bottom.

6. **Checking the shutter plates**

   Check that the shutter plates can be moved freely over a sufficiently long distance in their grooves and that the plate closes tightly in its lowest position.

7. **Check** that there are no foreign objects inside the elevator and all its inspection and service hatches are closed.

8. **Grain pipes**

   Check that the grain pipes leaving from the divider are properly fastened and the gradient is sufficient (at least 45º for wet grain, and at least 30º for dry grain).

   The grain pipes of the E100 and E120 elevators must be at least 250 mm in diameter. The transfer capacity of 200 mm grain pipes is sufficient for the E40, E60 and E80 elevators.

9. **Make sure** the electric motor is connected to rotate in the right direction.

Operating the Elevator

Before switching on the elevator, always check that

* no other person is cleaning or servicing the elevator, for example, on some other floor of the building.
* all service and inspection hatches of the elevator are closed.
* the divider and the grain pipes are in their intended positions.
* the shutter plate is in the **closed**-position.

Switch on the elevator before opening the shutter plates. Usually the shutter plate on the ascending side of the elevator can be opened completely. The shutter plate on the return side can be opened to about half. This enables the maximum output to be achieved.

With turnip rape and dry food grain, the maximum output can usually be achieved by opening the shutter plates slightly less.

If you open the shutter plates too much, the elevator may congest and stop. If the elevator stops while operating at full capacity, it will not be able to restart. In this case, close the shutter plates and channel off excess grain from the lower opening of the elevator. The elevator can be restarted as soon as the grain flow from the lower opening has stopped.

Before changing the cereal it is often necessary to clean the elevator as thoroughly as possible. In this case carry out the checking and cleaning as follows:

* check that there is no grain left in the hopper seams and brush it off, if necessary
* keep the elevator running until the rustling of individual grains can no longer be heard from the frame pipes,
* stop the elevator and open the hatch at the side of the boot. Brush off the last grains from the inner floor using a brush with a handle.

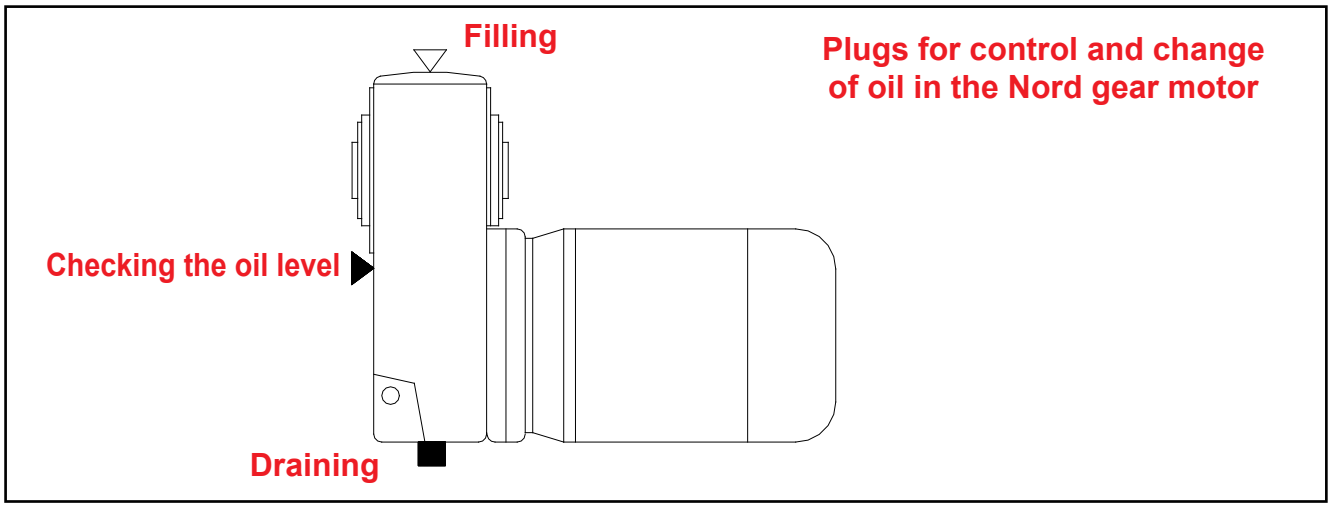
Warning! Never put your hands in the lower opening of the elevator!!

To avoid mixing of cereals, do not change the setting of the 3-way divider before the grain flow has stopped or until it has been switched off for a while.

SERVICING

Annual service

* Clean up the cooling ribs of the motor and the air impeller.
* Check the condition and tightness of the bucket belt. Adjust as necessary.
* Check the condition and attachment of the buckets.
* Ensure the belt is running properly on the pulley. Check and adjust as necessary.
* Check the position of the bucket belt pulley scrapers. Adjust as necessary.
* Check and lubricate the bearings.
* Check the oil level in the gear motor. Disconnect the gear motor from the torque arm and the elevator shaft for oil level control and shift the gear motor supported by a hoist outward on the elevator shaft as much as is necessary to open the oil control plug using a hexagon socket key (6 mm) and to check the oil level. Note, that the gear motor must remain parallel with the shaft. Top up recommended oil, if necessary. Put the plugs in place. Fasten the gear motor back in place
* Change the oil at least every two years. The oil volume of the gear is 4,75 litres. Recommended oil types for gear motors are:
  mineral oils CASTROL Alpha SP 680, ESSO Spartan EP 220, MOBIL Mobilgear 636 tai Mobilgear XMP 680, SHELL Omala 680;
  synthetic oils CASTROL Alphasyn PG 220, ESSO Glycolube 220, MOBIL Glygoyle HE 680, SHELL Tivela S 680 or other oil brands which meet the same requirements.



GUARANTEE

The guarantee period for Antti elevators is one (1) operating season. The guarantee covers defects in material and workmanship. Separate guarantee terms issued by the respective importer apply to the electric motors.

A prerequisite for validity of the guarantee is that the instructions, given by the manufacturer, and the valid regulations are followed during the installation, operation and maintenance work of the elevator.

All matters related to the guarantee shall be agreed upon with the manufacturer before any action is taken.

MALFUNCTIONS DURING OPERATION

Possible malfunctions in the elevator

Symptoms	Possible cause	Remedy
Elevator does not start		
	Selector switch in electric centre is in position 0	Turn the selector switch to running-position.
	Fuse/motor guard has tripped.	Change or reset the fuse/motor guard.
	Position of the underspeed guard sensor has changed-	Adjust the distance between the sensor and the claw-plate to 5 mm.
Elevator runs for a while and then stops		
	Position of the underspeed guard sensor has changed.	Adjust the distance between the sensor and the claw-plate to 5 mm.
	Underspeed guard relay in the electric centre has failed.	Let an authorised electrician check the adjustment of the potentiometer or change the relay.
	Underspeed guard rotates too slowly, because the bucket belt is too slack.	Tighten the bucket belt by shortening.
	Rotation speed of the gearmotor too low.	Gear motor damaged.
Elevator stops prematurely		
	Bucket belt is too slack (underspeed guard trips as a result of too low speed).	Tighten the bucket belt by shortening.
	Feeding rate is too high, protection switch for the engine has tripped.	Elevator has to be emptied (see Operating Instructions), reset the protection switch and readjust the feeding rate.
	Divider or pipe system is blocked (presence of foreign objects or inclination or diameter of the pipes too small).	Remove the cause for congestion.

Symptoms	Possible cause	Remedy
Capacity of the elevator too low		
	Divider or pipe system is blocked (presence of foreign objects or inclination or diameter of the pipes too small)	Remove the cause for congestion
	Distance between the adjustment plate and the buckets in the top end too big	Adjust the distance from the adjustment plate to the buckets to 10 mm
	Incorrect electric connections of the motor Incorrect Y/D – connection	Assign an electrician to check the connections
	Access of grain into the elevator obstructed	Eliminate too tight or too gentle spots
Elevator buckets make noise at the boot		
	Bucket belt is slack	Tighten the bucket belt by shortening.
	Elevator boot is not upright; the bucket belt does not run in the middle of the pulley	Check that the boot stands exactly upright and adjust the bucket belt to run in the middle of the pulley. No deposits of dirt are allowed on the pulley. Adjustment of the scraper for the pulley must be correct.
	Possible bearing damage	Replace the bearings for the bucket pulley shaft at the boot
	Bucket belt is damaged (resulting from foreign objects, rodents or a broken bucket)	Replace the damaged bucket or belt

Symptoms	Possible cause	Remedy
Buckets make noise in the top end		
	Bucket belt is slack	Tighten the bucket belt by shortening.
	Elevator boot is not upright; the bucket belt does not run in the middle of the pulley	Check that the boot stands exactly upright and adjust the bucket belt to run in the middle of the pulley. No deposits of dirt are allowed on the pulley. Adjustment of the scraper for the pulley must be correct.
	Possible bearing damage	Replace the bearings for the bucket pulley shaft at the boot
	Bucket belt is damaged (resulting from foreign objects, rodents or a broken bucket)	Replace the damaged bucket or belt
	Adjustment plate too close to the buckets.	Adjust the distance from the adjustment plate to the buckets to 10 mm.
Elevator buckets make noise inside the frame pipes		
	Frame pipes are in an oblique position	Using a plumb line, check that the entire elevator with frame pipes stands upright and straighten them as necessary
Bearings make abnormal noise		
	Bearing damaged	Replace bearing
	Inner race of the bearing rotates on the shaft	Tighten the stop screws. If it does not help, replace both the bearing pair and the shaft
Elevator is congested or jams, the motor does not stop and the bucket belt slips.		
	Underspeed guard has failed.	Assign an electrician to check the operation of the underspeed guard; repair as necessary.

EU Declaration of Conformity

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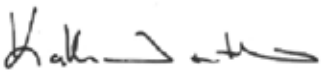
declares that

ANTTI E-series elevator

conforms with the provisions of the following directives:

- Machine Directive 2006/42/EY
- Low Voltage Directive 2006/95/EY
- Electro-Magnetic Compatibility Directive (EMC) 2004/108/EY

Kuusjoki 01.02.2011



Kalle Isotalo
Managing Director